INDUSTRIAL MEDICINE *and* SURGERY

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MARCH 1961

Volume 30 Number 3

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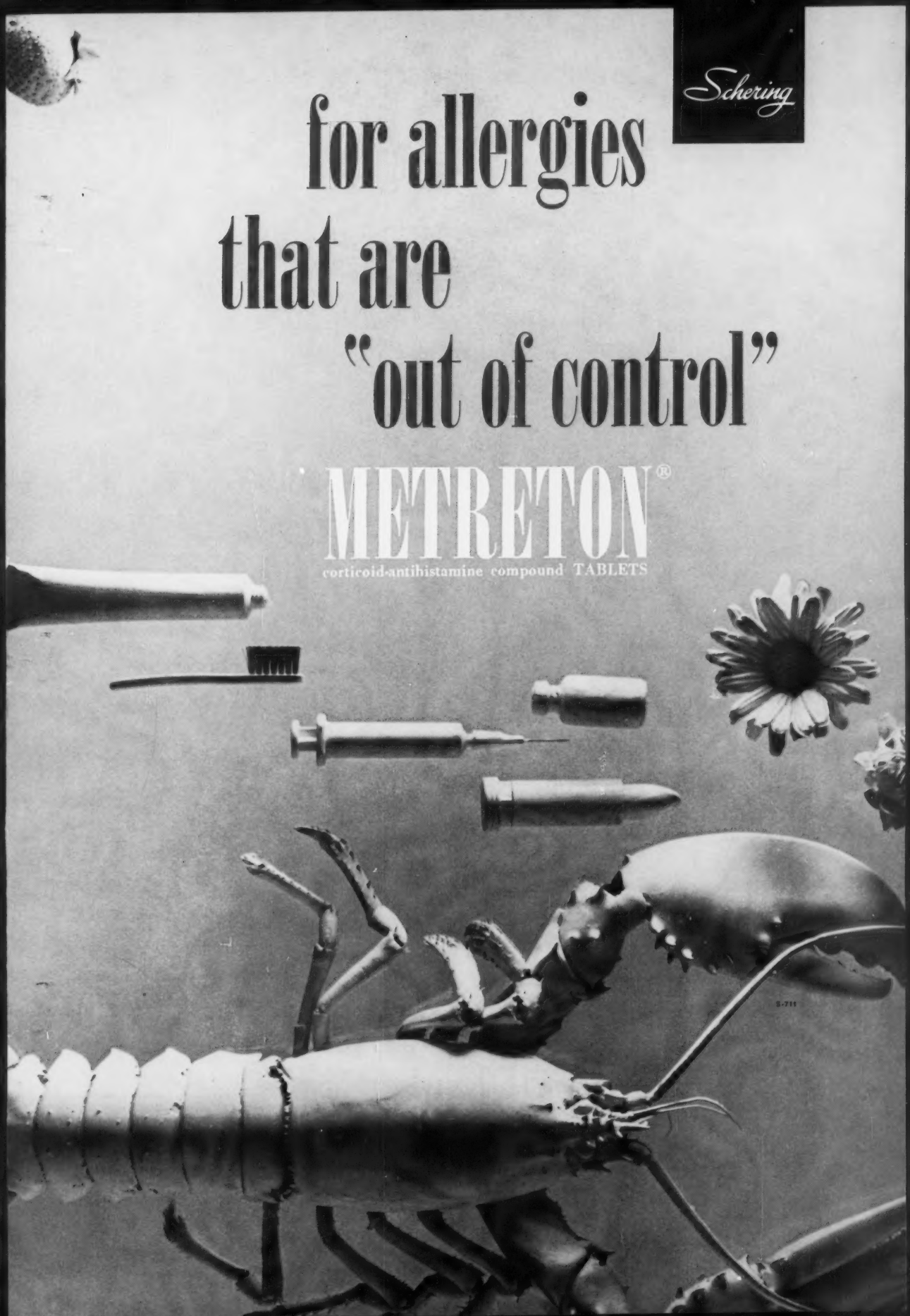
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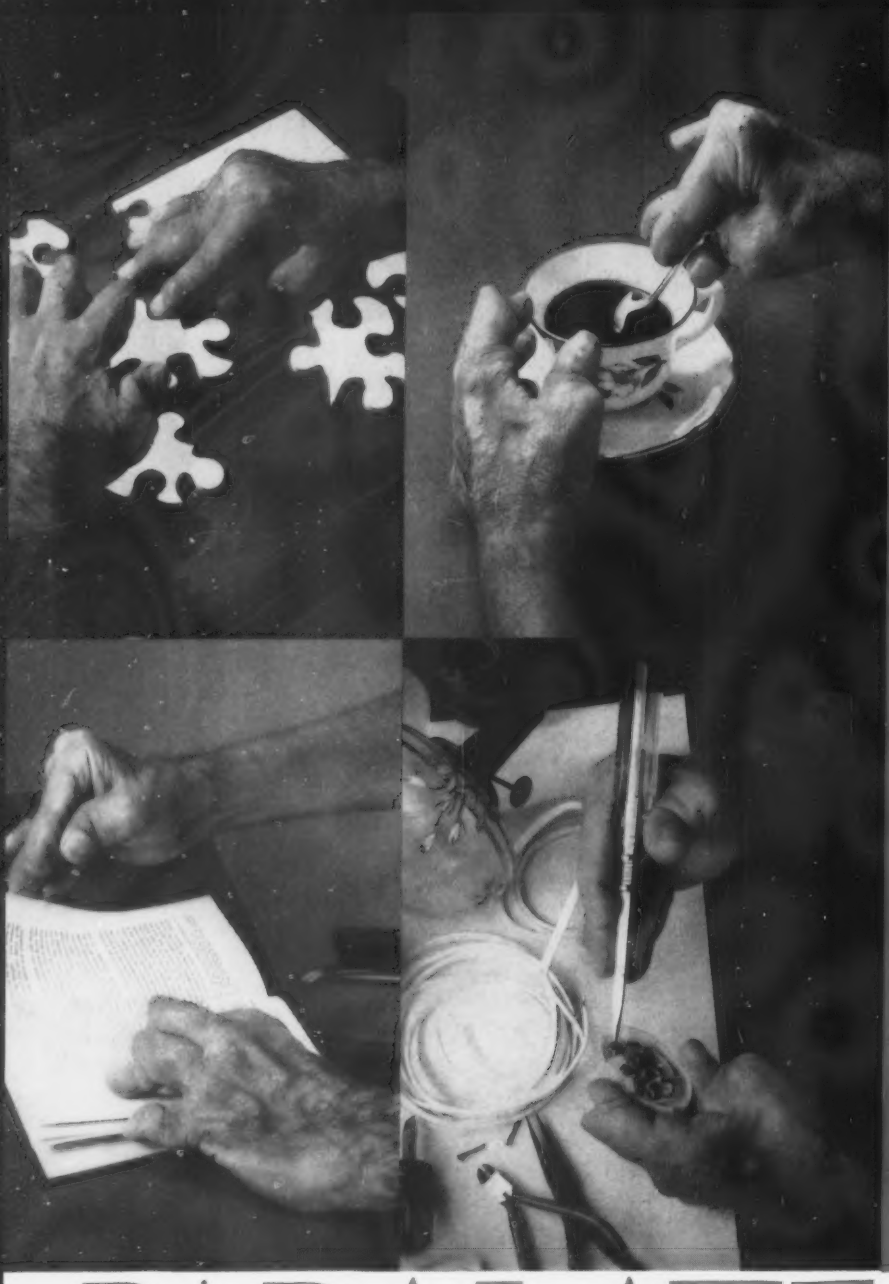

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1. Barden, F. W., et al.: J. Maine M. A. 46:99, 1955.
2. Ford, R. A., and Blanchard, K.: Journal-Lancet 78:185, 1958.

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INDUSTRIAL MEDICINE and SURGERY

ESTABLISHED 1932

The International Journal of Medicine in Industry

MARCH, 1961
VOLUME XXX
NUMBER 3

CONTENTS

Granulomatous Inflammation of the Bursae 89
John E. Kirkpatrick, M.D.

Motivating for Accident Prevention 93
William R. Conte, M.D.

Byssinosis — A Review 95
E. A. Shaptini, M.D.

Tennis Leg — A New Method of Treatment 101
Eugene J. Morhous, M.D.

What Is Aging? 103
Frederick C. Swartz, M.D., F.A.C.P.

Acute Upper Respiratory Disorders — Symptomatic Management in Industrial Practice 107
Carl S. Plumb, M.D., M.P.H.

Organization and Operation of a Small Plant Industrial Medical Service in France 109
Madeleine Exbrayat, M.D.

Systematic Health Examinations in Industry — A Yugoslavian Experience 113
Dr. M. Saric

The Present Status and the Future of Workmen's Compensation Laws, The Viewpoint of Management 119
Carl N. Jacobs

Books 125

Editorial: How Much Health Do Workers Really Want? .. 129

Personal News and Notes 4, 6

Industrial Health Conference: 1961 Program 8

American Industrial Hygiene Conference: 1961 Program .. 12

Comment and Opinion 39

Index of Advertisers 50

INDUSTRIAL MEDICINE AND SURGERY, The Journal of Medicine in Industry, consolidating "The Industrial Doctor," "Industrial Medicine," and "International Journal of Medicine and Surgery": Entered as second class matter August 28, 1941, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879. Reentered, October 3, 1949. Additional entry at Sheboygan, Wisconsin. Published on the fifth of each month by INDUSTRIAL MEDICINE PUBLISHING COMPANY, Miami, Florida. STEPHEN G. HALOS, Chairman; STEPHEN F. HALOS, President; HAROLD A. HOOPER, Treasurer; CAREY P. MCCORD, M.D., Editor; A. D. CLOUD, Editorial Consultant; LUCILLE H. GROSS, Circulation Manager; T. W. PINKARD, Production Manager. EXECUTIVE OFFICES, 400 S.W. 69th Avenue, Miami 44, Florida. PUBLICATION, EDITORIAL AND CIRCULATION matters should be addressed to P. O. Box 44-306, Miami 44. Subscriptions in United States $6.00 per year, $10.00 for 2 years; in Canada $8.00 per year, $14.00 for 2 years; in other countries $12.00 (U.S. Currency) per year, $20.00 for 2 years. Single copies $1.25. Title Registered in United States Patent Office. Registered Canada, 1942.

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PERSONAL NEWS AND NOTES

KENDALL A. ELSOM, M.D., has been appointed to the newly-created position of Medical Director at Scott Paper Company, Chester, Pa. He joins the company after having served since 1951 as Director of the Diagnostic Clinic at the Hospital of the University of Pennsylvania, and as Professor of Clinical Medicine.

DR. ELSOM was graduated in 1924 from the University of Wisconsin where he served for a year as student instructor in physiology. He was awarded an M.D. from the University of Pennsylvania in 1927, where he held appointments in the Departments of Pharmacology and Medicine. In 1936 he decided to devote himself to clinical medicine, and he specialized in gastroenterology.

During World War II, DR. ELSOM served as Chief of Gastroenterology and later as Assistant Chief of Medical Service for the 20th General Hospital in Ledo, Assam, India, and as Chief of Medicine at the Army Service Forces Hospital, Fort Benning, Georgia. He was discharged with the rank of Lieutenant Colonel.

JOHN L. NORRIS, M.D., Rochester, N. Y., was elected President of the American Academy of Occupational Medicine at the annual meeting held in Detroit, February 8 through 10. Other newly elected officers are LEO WADE, M.D., New York City, Vice-President; PAUL J. WHITAKER, M.D., Milwaukee, Secretary; JACK H. WOLFSIE, M.D., Linden, N. J., Treasurer; and S. CHARLES FRANCO, M.D., New York City, Director.

Other directors include R. LOMAX WELLS, M.D., Washington, D. C.; GEORGE F. WILKINS, Boston; JOSEPH A. QUIGLEY, M.D., Cincinnati.

The Academy's Award of Honor was presented to ARTHUR J. VORWALD, M.D., Wayne University Medical School, Detroit, at the Annual Banquet, which was held on February 9, 1961.

DUANE L. BLOCK, M.D., President, and RICHARD MUDD, M.D., President-Elect, will preside at the annual meeting of the Michigan Industrial Medical Association to be held March 24, 1961 at the Statler Hilton Hotel in Detroit. All interested members of the medical profession are invited to attend the meetings, which will commence at 9 a.m.

Among the papers scheduled are the following: "Acute Psychiatric Problems in Industry," MARVIN SHERMAN, M.D., Psychiatrist, Metropolitan Hospital; "Closed Chest Cardiac Massage," MUIR CLAPPER, M.D., Associate Professor of Medicine, Wayne State University; "Acute Renal Failure," IVAN J. MADER, M.D., Internist, Detroit Receiving Hospital; and "Petroleum Products and Carcinogenesis," ROBERT E. ECKARDT, M.D., Medical Director, Esso Research and Engineering Company. A panel discussion on "Problems of the Aging Worker" will be presented, from the viewpoints of the private physician: HAZEN PRICE, M.D., Internist; the industrial engineer: MR. L. J. LANGTON; and the disability examiner: LOUIS STEINER, M.D., Internist. MR. W. HARTSELL WILSON, Assistant General Sales Manager, Plymouth Division, Chrysler Corporation, will speak at the annual dinner.

The Michigan Academy of General Practice will grant five hours of Category II Credit for attendance at this meeting.

A ten-week course in radiation safety and health physics will be offered to personnel from public agencies by the Industrial Hygiene and Safety Division of Argonne National Laboratory, Argonne, Illinois.

The Laboratory will conduct the tuition-free course from March 13 through May 19, 1961, under the sponsorship of the U.S. Atomic Energy Commission.

The program will provide practical training in radiation safety and health physics for personnel from federal, state and municipal public agencies. Argonne's health physicists, industrial hygienists and safety engineers will conduct the training program, utilizing the extensive operating nuclear facilities available at the laboratory.

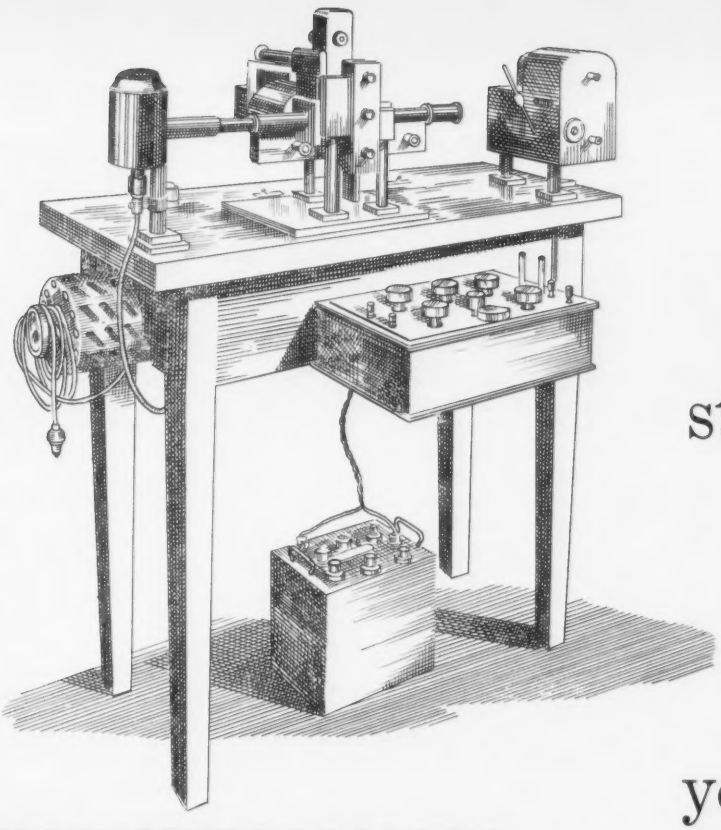
The course is tuition-free. Travel costs and living expenses will be paid by the student or his sponsoring agency.

JOHN M. BREWSTER, M.D., has been appointed Medical Director of the Pennsylvania Railroad with system-wide supervision over the road's health maintenance program, it was announced today by James W. Oram, vice president in charge of public and employee relations. He succeeds ALEXANDER M. W. HURSH, M.D., who is retiring.

DR. BREWSTER has been the regional medical officer at Philadelphia since 1955. He is a graduate of Jefferson Medical College, and completed a postgraduate course in surgery at the University of Pennsylvania. Serving in the U. S. Navy medical corps, he was senior medical officer on the U. S. S. Pennsylvania, flagship of the Pacific fleet, when she was attacked by the Japanese at Pearl Harbor.

He was commanding officer of a fleet hospital in the South Pacific during World War II, after which he continued in the Navy as fleet medical officer, executive officer of the Great Lakes Naval Hospital, commanding officer of the Corpus Christi, Tex., Naval Hospital, and senior medical member of the Fourth Naval District physical evaluation board. He joined the Pennsylvania Railroad in 1952 as medical officer, Philadelphia Terminal Division.

DR. HURSH, retiring Medical Director, received his degree in medicine at Jefferson Medical



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College. He began railroad work in 1925 as an assistant medical examiner at Sunbury, Pa. He is a member of the executive committee of the American Association of Railway Surgeons, and of the Alpha Omega Alpha Honorary Medical Fraternity.

DR. BREWSTER is a fellow of the American College of Surgeons, a member of the staffs of Bryn Mawr and St. Agnes Hospitals, and a lecturer in preventive medicine at the University of Pennsylvania Medical School.

Industrial Hygiene Foundation will hold its 26th annual meeting at the Mellon Institute, Pittsburgh, Pa., October 25 and 26, 1961.

For further information, write to Dr. H. H. Schrenk, Managing Director, Industrial Hygiene Foundation, 4400 Fifth Avenue, Pittsburgh 13, Pa.

J. SHARP QUEENER, Manager of the Safety and Fire Protection Division of E. I. duPont de Nemours, Inc., has been named Chairman of the General Safety Committee of the Manufacturing Chemists' Association. MR. QUEENER joined DuPont in 1929 and has held supervisory positions in operating, personnel, and safety activities.

A native of Nashville, Tenn., MR. QUEENER has been a member of the MCA Safety Committee since 1951. He is also a member of the Board of Directors of the National Safety Council, the National Fire Protection Association and the Delaware Safety Council.

ALBERT DAMON, M.D., has been appointed Associate Professor of Medical Anthropology in the Department of Industrial Hygiene, Harvard School of Public Health. DR. DAMON graduated from Harvard College in 1938, and from the Harvard Medical School in 1951.

MISS SARA P. WAGNER, Director of Nurses, Standard Oil Company (N. J.) was guest speaker at the 8th Annual Nurse-Management Dinner of the Greater New York Association of Industrial Nurses, Inc., on February 14. Her topic was "Nurse-Management Relationships."

MISS WAGNER is a member of the Greater New York Association of Industrial Nurses; a permanent member of the International Association on Occupational Health and secretary to the American Delegation; a lecturer on Industrial Medicine at Post Graduate Medical School, New York University. She is currently a member of the Committee on Education of the American Association of Industrial Nurses.

JOHN S. HATHAWAY, M.D., Director, and JAMES S. DAVIE, Staff Sociologist and Coordinator of Research, both of the Department of University Health, Yale University, will report to the Council on Occupational Health Nursing on a research project on the "Role of the Nurse in a University Health Service," at the National League for Nursing Convention, April 10 to 14, 1961, in Cleveland, Ohio.

Died

ROBERT LOGAN QUIMBY, M.D., 50, Boston, Mass., on Dec. 12, 1960. DR. QUIMBY was New England Medical Director, Loss Prevention Medical Service, Liberty Mutual Insurance Companies, from 1951 until his death. Since 1957, he served as Visiting Lecturer on Industrial Medicine, Harvard Medical School.

HENRY STEPHEN ATKINSON, M.D., on October 30, 1960, at age 60, of coronary disease. A resident of Green Bay, Wisconsin, DR. ATKINSON was a past president of the Association of Railway Surgeons and was for many years team physician for the Green Bay Packers professional football team.

WALTER DICKENSON WOODWARD, M.D., on October 8, 1960, at age 44, of cancer of the brain. DR. WOODWARD, of Staten Island, New York, was Chief Psychiatrist for the American Cyanamid Company and an instructor in psychiatry at Cornell University Medical College.

WILLIAM A. MORAN, JR., M.D., 61, in Washington, D. C. on October 2, 1960, of cancer of the neck. DR. MORAN was Medical Director of the United States Government Printing Office.

JAMES THELMER LARSON, M.D., on September 9, 1960, at age 56, of coronary thrombosis. DR. LARSON was Medical Director of Swift and Company, and lives in South St. Paul, Minn.

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Cardiology in Industry

Faculty: RICHARD CALL, M.D., Medical Director, Union Oil Co. of Calif., Los Angeles.

Course Coordinator: HALLETT A. LEWIS, M.D., Medical Director, Kaiser Steel Corp., Fontana, Calif.

Treatment of Radiation Injury

Faculty: GOULD A. ANDREWS, JR., M.D., Chief of Clinical Services, Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tenn., HARRY FOREMAN, M.D., Los Alamos Scientific Laboratory, Los Alamos, N. M., W. D. NORWOOD, M.D., Manager, Health Operation, General Electric Co., Richland, Wash., GEORGE L. VOELZ, M.D., Chief, Medical Services Branch, Atomic Energy Commission, Idaho Falls, Idaho. Course Coordinator: THOMAS L. SHIPMAN, M.D., Health Division Leader, Los Alamos Scientific Laboratory, Los Alamos, N. M.

1. Medical Supervision of Workers Potentially Exposed to Radiation — DR. VOELZ.

2. Treatment of Individuals Who Have Excessive Deposition of Radioisotopes — DR. NORWOOD.

3. Treatment of Skin Wounds Contaminated by Radioactive Materials, Treatment of Radiodermatitis (Beta Ray Burns) — DR. FOREMAN.

4. Treatment of Patients Suffering from Acute Radiation Injury — DR. ANDREWS.

WEDNESDAY, APRIL 12
Dermatology in Industry

Faculty: RAYMOND R. SUSKIND, M.D., Associate Professor of Industrial Medicine and Dermatology, University of Cincinnati, Cincinnati. Course Coordinator: MERLE BUNDY, M.D., United States Steel Corp., Pittsburgh, Pa.

Hearing Conservation in Industry

Faculty: ARAM GLORIG, JR., M.D., Director of Research, Subcommittee on Noise, American Academy of Ophthalmology and Otolaryngology, Los Angeles. Course Coordinator: JAMES P. HUGHES, M.D., Medical Director, Kaiser Aluminum and Chemical Corp., Oakland, Calif.

CLINICS IN TRAUMA
Fractures and Crush Injuries of the Forearm and Hand

HERBERT J. KIRCHNER, M.D., President, Section of Industrial Medicine and Surgery, Los Angeles County Medical Assn., Presiding. Lecturer and Discussion Leader: JAMES N. WILSON, M.D., Orthopedic Surgeon, Los Angeles.

Problems of the Back

LEON DESIMONE, M.D., Board of Directors, Western I.M.A., Los Angeles, Presiding. Lecturer and Discussion Leader: HOMER C. PHEASANT, M.D., Chairman, Medical Staff, Orthopaedic Hospital, Los Angeles.

Injuries of the Leg and Ankle

PACKARD THURBER, JR., M.D., Associate Clinical Professor of Preventive Medicine and Public Health, University of California, Los Angeles, Presiding. Lecturer and Discussion Leader: JOHN C. WILSON, JR., M.D., Ass't Clinical Professor of Orthopedic Surgery, Univ. of Southern California, Los Angeles.

Rehabilitation of the Industrially Injured — A Panel with Case Presentations

Moderator: ASA BARNES, M.D., Chairman, Committee on Medical Care, I.M.A., Louisville, Ky.

Injuries of the Spinal Cord — THOMAS GUCKER III, M.D., Director, Rehabilitation Center, Orthopaedic Hospital, Los Angeles.

Upper Extremity Function in Patients with Severe Cervical Spine Injury — VERNON L. NICKEL, M.D., Chief of Surgical Service, Rancho Los Amigos Hospital, Downey, Calif.

Amputations — CHARLES O. BECHTOL, M.D., Professor of Surgery (Orthopedics), University of California, Los Angeles.

Injuries of the Back — JOHN H. ALDES, M.D., Director, Ben R. Meyer Rehabilitation Center, Los Angeles.

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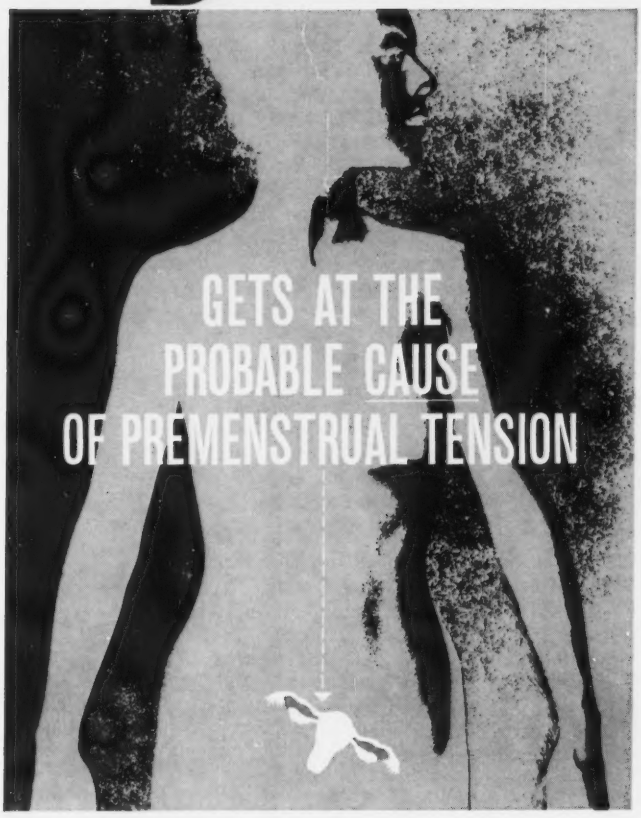

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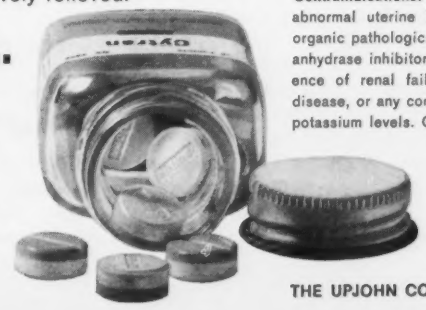

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WEDNESDAY, APRIL 12

General Session — MEDICINE

The Chest and Industry

RUTHERFORD T. JOHNSTONE, M.D., Clinical Professor of Industrial Medicine, University of California, Los Angeles, Presiding.

Pneumoconiosis Among Pennsylvania Bituminous Coal Miners —JAN LIEBEN, M.D., Director, Division of Occupational Health, Pennsylvania Dept. of Health, Harrisburg, and W. W. McBRIDE, M.D., Pennsylvania Dept. of Health, Harrisburg.

Cancer of the Lung in a Public Utility — A Fifteen-Year Study — 1946-1960 — HENRY A. CHRISTIAN, M.D., Consolidated Edison Co., New York City.

Resuscitation Techniques

RALPH DE FOREST, M.D., Secretary, Council on Medical Physics, American Medical Association, Chicago, Presiding.

Mouth-to-Mouth Resuscitation, With and Without Adjuncts — ARCHER S. GORDON, M.D., Director of Heart-Lung Surgery Research, Children's Hospital, Los Angeles.

The Rationale for the Change in Resuscitation Techniques — Mr. ROGER C. PLAISTED, Director of Safety Services, American National Red Cross, Los Angeles.

Resuscitation Training and Application of Techniques in Industry — Mr. JACK STORY, Supervisor of First-Aid Training, Pacific Telephone and Telegraph Co., Los Angeles.

THURSDAY, APRIL 13

General Session — MEDICINE AND SURGERY

Aching Feet in Industry

O. TOD MALLERY, JR., M.D., Medical Director, Employers Mutuals of Wausau, Wausau, Wisconsin, Presiding.

The Contemporary Field of Podiatry — RAYFIELD ARONOW, D.S.C., Podiatrist, Los Angeles.

Podiatry Programs in Industry — LAWRENCE HENDEL, D.S.C., Podiatrist, Los Angeles.

Mental Health in Industry — An Open End Discussion

ALLAN J. FLEMING, M.D., Medical Director, E. I. du Pont de Nemours, Wilmington, Del., Presiding. Moderator: JOHN H. BEATTY, M.D., Henry J. Kaiser Co., Oakland, Calif. Participants: ALEC BAVELES, Ph.D., Professor of Psychology, Stanford University, Stanford, Calif., J. S. FELTON, M.D., Professor of Occupational Health, School of Public Health and School of Medicine, University of California, Los Angeles, MARVIN KLEMES, M.D., Ass't Professor of Psychiatry, University of California, Los Angeles, KENNETH J. MUNDEN, M.D., Division of Industrial Mental Health, Menninger Foundation, Topeka, The Reverend CLIFFORD PEACE, R. J. Reynolds Tobacco Co., Winston-Salem, N. C.

General Session — TOXICOLOGY AND INDUSTRIAL HYGIENE

(Arranged jointly by the Committee on Clinical Toxicology, I.M.A., and the Southern California Section, American Industrial Hygiene Association).

Industrial Hygiene Problems in the Missile Industries

MR. EDWARD K. DANIELS, Industrial Hygienist, Mobil Oil Company, Los Angeles, Presiding.

General Session — SURGERY

JOHN H. LEIMBACH, M.D., Medical Director, California Compensation Insurance Fund, San Francisco, Presiding.

Ice Water Treatment of Burns —ALEX G. SHULMAN, M.D., Associate Attending Staff Physician, Cedars of Lebanon Hospital, Los Angeles.

New and Common Uses of Felt for Injuries — NORMAN W. PAUL, M.D., Plant Physician, Lockheed Aircraft Corp., Burbank, Calif.

Diagnosis and Management of Blunt Trauma to the Abdomen — GORDON SMITH, M.D., Ass't Clinical Professor of Surgery, University of Southern California, Los Angeles.

Lumbar Spine Degenerative Joint Disease — To Fuse or Not to Fuse — HOMER C. PHEASANT, M.D.

Gynecological Problems in Industry — ROBERT J. McNEIL, M.D., Obstetrician and Gynecologist, Los Angeles.

General Session — MEDICINE

SEWARD E. MILLER, M.D., Director, Institute of Industrial Health, University of Michigan, Ann Arbor, Presiding.

A Work Classification Unit in Cardiology — ROBERT STIVELMAN, M.D., Director, Work Classification Unit, Los Angeles County Heart Assn.

The Entry of Electronic Computers into Modern Medical Practice — CHARLES SCHOETTLIN, M.D., Division of Air Pollution, Bay City, Texas.

Formats for the Future — Are I.M.A. Meetings in Need of Change? — HALLETT A. LEWIS, M.D.

Project HOPE — The Story of the SS Hope I, and Workers Abroad — WILLIAM B. WALSH, M.D., President, The People to People Foundation, Washington, D.C.

General Session — SURGERY

LEONARD ARLING, M.D., Director Northwest Industrial Clinic, Minneapolis, Presiding.

Treatment of the Patient with Multiple Injuries — A Discussion Panel

Moderator: D. JOHN LAUER, M.D., Medical Director, Int'l Telephone & Telegraph Corp., New York City. Participants: ROBERT C. COMBS, M.D., Ass't Clinical Prof. of Surgery, University of California, San Francisco. J. J. CRANE, M.D., Professor Emeritus of Urology, University of Southern California, Los Angeles. JOHN C. JONES, M.D., Clinical Professor of Surgery, Univ. of Southern California, Los Angeles. THEODORE KURZE, M.D., Ass't Professor of Neurosurgery, FRANCIS McKEEVER, M.D., Professor of Orthopedic Surgery, and WILLARD J. ZINN, M.D., Assoc. Clinical Prof. of Medicine, Univ. of Southern California, Los Angeles.

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Weiner, A. L., and Fixler, Z. C.: J.A.M.A. **169**:346, 1959.

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AMERICAN ASSOCIATION OF INDUSTRIAL NURSES

Theme: Challenges for the Future

TUESDAY, APRIL 11

CATHERINE R. DEMPSEY LECTURE — MARY H. MULVIHILL, R.N., A.A.I.N. Conference Chairman; Mobil Oil Company, Los Angeles, Calif.

Medicine in Space — BRIGADIER GENERAL DON FLICKINGER, Air Research and Development, U.S.A.F. Base Command, Washington, D.C.

Industrial Relations Among Professional People — MR. PAUL SAAD, Attorney, Tampa, Fla.

The Contemporary Scientist-Engineer — Joint Session with I.M.A.

His Emotional Configuration
His Adjustment to the Industrial Setting — JOHN WEIR, Ph.D.

WEDNESDAY, APRIL 12

Using Your Leadership Potential

ROBERT DORHMAN, Director of Training, Transport Indemnity Company, Los Angeles, Calif.; ROBERT LABARTHE, Director, Public Relations, Blue Cross, Los Angeles, Calif.; MARY E. DELEHANTY, R.N., Chief Nurse, The Equitable Life Assurance Society of the United States, New York, N. Y.

THURSDAY, APRIL 13

Industry's Million Dollar Asset

Moderator: ARTHUR L. KNIGHT, M.D., Medical Director, Bausch & Lomb, Inc., Rochester, N. Y.; HOWARD MITCHELL, M.D., Chief of the Bureau of Occupational Health, Department of Public Health, Berkeley, Calif.; JUSTIN JOHNSON, Community Relations Supervisor, Hughes Aircraft, Culver City, Calif.; KAY KELLY, R.N., Consultant, Liberty Mutual Insurance Company, San Francisco, Calif.

Greater Knowledge — Greater Service

Moderator: SARA P. WAGNER, R.N., Director of Nurses, Standard Oil Company of New Jersey, New York, N. Y.; ANITA M. HARRIS, R.N., Consultant, Socony Mobil Oil Company, New York, N.Y.; CATHERINE M. COLLING, R.N., Standard Oil Company of California, San Francisco, Calif.; MARY WILEY, R.N., Sears Roebuck & Company, Philadelphia, Pa.

AMERICAN INDUSTRIAL HYGIENE CONFERENCE

APRIL 9-13, 1961

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AMERICAN INDUSTRIAL HYGIENE ASSOCIATION

MONDAY, APRIL 10

Course No. 1: **Dust Counting with the Phase Microscope** — GERMAIN CROSSMON, Industrial Hygienist, Medical Department, Bausch & Lomb, Inc., Rochester, N.Y.

Course No. 2: **Importance of Isokinetic Sampling and How to Achieve It** — PAUL M. GIEVER, Assistant Professor, Industrial Health, University of Michigan School of Public Health, Ann Arbor, Mich.

Course No. 3: **Industrial Noise Measurement** — JAMES H. BOTSFORD, Bethlehem Steel Company, Bethlehem, Pa.

Course No. 4: **How to Calibrate a Swinging Vane Anemometer** — GEORGE M. HAMA, Sr. Associate Industrial Hygienist, Bureau of Industrial Hygiene, City of Detroit Department of Health, Detroit, Mich.

Course **No. 5: Permissible Dose for Internal Radiation** — KARL Z. MORGAN, Ph.D., Oak Ridge National Laboratory, Union Carbide Nuclear Company, Oak Ridge, Tenn.

Course No. 6: **Radiated Heat Measurement and Calculation** —

Course No. 7: **The Language of Industrial Toxicology** — JOSEPH F. TREON, Ph.D., Manager, Biological Sciences Section, Atlas Powder Company, Wilmington, Del.

Course No. 8: **Identification of Solvent Mixtures:** — RALPH G. SMITH, Ph.D., Associate Professor Department of Industrial Medicine and Hygiene, College of Medicine, Wayne State University, Detroit, Mich.

Course No. 9: **Theory and Use of the Pitot Tube** — KNOWLTON J. CAPLAN, Mallinckrodt Chemical Works, St. Charles, Mo.

OPENING GENERAL SESSION

ELMER P. WHEELER, Chairman, Monsanto Chemical Company, St. Louis, Mo.

Welcome to 22nd Annual AIHA Meeting — JACK C. RADCLIFFE, President.

Welcome to the Motor City — The New Detroit — LOUIS MIRIANI, Mayor, City of Detroit.

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Industrial Hygiene Objectives in Industry, Labor, Government and Education

Industry — K. D. CASSIDY, Vice President, Ford Motor Company, Dearborn, Mich.

Organized Labor — LEONARD WOODCOCK, Vice President, UAW, AFL-CIO, Detroit, Mich.

Government — JOSEPH G. MOLNER, M.D., Health Commissioner, City of Detroit Department of Health, Detroit, Mich.

Education — University of Michigan — MARVIN L. NIEHUSS, Vice President and Dean of Faculties, Ann Arbor, Mich.

Wayne State University — GORDON H. SCOTT, Ph.D., Dean, College of Medicine, Wayne State University, Detroit, Mich.

Cummings Memorial Lecture — W. G. FREDRICK, Sc.D., Director, Bureau of Industrial Hygiene, City of Detroit Department of Health, Detroit, Mich.

TUESDAY, APRIL 11
Concurrent Session — CHEMICAL AND ANALYTICAL

EVAN E. CAMPBELL, Session Arranger; Health Division, Los Alamos Scientific Laboratory, Los Alamos, N. M.

I. Determination of Inorganic Materials in Air and Biological Samples

MRS. KATHLEEN KUMLER, Chairman; General Motors Corp., Warren, Mich.

Determination of Arsenic in Air and Biological Products — L. DuBOIS and J. L. MONKMAN, Department of National Health and Welfare, Ottawa, Ontario, Canada.

Ultramicrodetermination of Mercury in Blood — M. B. JACOBS, Ph.D., and L. J. GOLDWATER, M.D., Columbia University, School of Public Health and Administrative Medicine, New York City.

Determination of Urinary Fluorides — L. DuBOIS and J. L. MONKMAN.

Business Session of the Chemical and Analytical Section — WILLIAM H. HILL, Ph.D., Assistant Research Professor of Industrial Hygiene, University of Pittsburgh, Graduate School of Public Health, Pittsburgh, Pa.

II. Instrumental Laboratory Methods of Air Analysis

FRANKLIN A. MILLER, Chairman; Eastman Kodak Company, Rochester, N. Y.

Ultraviolet Spectrophotometric and Fluorescence Data — J. A. HOUGHTON, Liberty Mutual Insurance Company, Boston, Mass.

X-Ray Diffraction Analysis of Air-Borne Dust — N. A. TALVITIE, Department of Health, Education and Welfare, U. S. Public Health Service, Cincinnati, O.

Direct-Reading Beryllium Spectrograph — WALTER VAN SANDT, Lawrence Radiation Laboratory, University of California, Livermore, Cal.

Concurrent Session — ENGINEERING

M. F. CLAY, Session Arranger; General Electric Company, Cincinnati, O.

Removal of Solid Particles From a Solid Surface by a Turbulent Air Stream — MORTON CORN and LESLIE SILVERMAN, Sc.D., Harvard University School of Public Health, Boston, Mass.

Requirements for Freeze Protection for Industrial Supply Air Systems — JOHN H. CLARKE, Visking Corporation, Division of Union Carbide Corporation, Chicago, Ill.

A Novel Design for Beaker Evaporation Hoods — M. LIPPMANN, E. CHRISTOFANO and W. B. HARRIS, U. S. Atomic Energy Commission, New York Operations Office, New York City.

A Wind Tunnel for Providing Known Air Movement — RICHARD S. BRIEF and FRANKLIN CHURCH, Esso Research and Engineering Company, Linden, N. J.

In-Service Cleaning of Electric Motors — D. L. STODDARD and W. R. WELLS, Oak Ridge Gaseous Diffusion Plant, Union Carbide Nuclear Company, Oak Ridge, Tenn.

Exposure Control in Lead Shield Fabrication Work for Nuclear Powered Submarines — G. J. ROSATI and DENNIN, Mare Island Naval Shipyard, Vallejo, Cal.

Concurrent Session — MEDICAL

THOMAS L. SHIPMAN, M.D., Session Arranger; Los Alamos Scientific Laboratory, Los Alamos, N. M.

Occupational Health Grab-Bag — Idea swapping within the audience.

GENERAL MEDICAL SESSION
AIHA & ACGIH

THOMAS L. SHIPMAN, M.D., Arranger and Moderator.

Introduction — THOMAS L. SHIPMAN, M.D.

Changing Objectives in Occupational Health — THEODORE F. HATCH, Professor of Industrial Health Engineering, University of Pittsburgh, Graduate School of Public Health, Pittsburgh, Pa.

New Concepts and Methods of Measuring Man in Relation to His Environment

Modern Concepts of Air Sampling and Problems For the Future — HARRY F. SCHULTE, Los Alamos Scientific Laboratory, Los Alamos, N. M.

Modern Concepts of Analytical Chemistry in Industrial Hygiene and Problems for the Future — J. CHOLAK, Associate Professor of Industrial Health; University of Cincinnati, College of Medicine, Cincinnati, O.

New Concepts in Toxicology and Future Trends — HERBERT E. STOKINGER, Ph.D., Chief, Toxicologic Services, Occupational Health Field Headquarters, U. S. Public Health Service, Cincinnati, O.

New Approaches to the Evaluation and Treatment of Occupational Disease

WEDNESDAY, APRIL 12
GENERAL SESSION

ALLEN D. BRANDT, Sc.D., Chairman; Manager, Industrial Health Engineering, Bethlehem Steel Company, Bethlehem, Pa.

A Re-Evaluation: Future of Industrial Hygiene — ANNA M. BAETJER, Sc.D., Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

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Controls inflammation, curtails swelling, curbs pain

1. Teitel, L. H., *et al.*: Indust. Med. *29*:150, 1960. 2. Billow, B. W., *et al.*: Southwestern Med. *41*:286, 1960. 3. Beck, C., *et al.*: Clin. Med. 7:519, 1960. 4. Clinical Reports to the Medical Department, Armour Pharmaceutical Company, 1960.

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Results of Studies of Solvent Vapors: Exposure of Human Beings

Infrared Technics in Toxicological Studies — D. S. ERLEY, Dow Chemical Company, Midland, Mich.

Human Exposure to Solvent Vapors Commonly Found in Industry — R. D. STEWART, M.D., et al., Dow Chemical Company, Midland, Mich.

Industrial Benzene Exposure from Petroleum Naphtha — L. D. PAGNOTTO, H. B. ELKINS, Ph.D. and H. G. BRUGSCH, Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, Boston 10, Mass., and JANET E. WALKLEY, Occupational Health Services, Cambridge, Mass.

Concurrent Session — AIR POLLUTION

ROBERT T. PRING, Session Arranger; Dracco, Division of Fuller Company, Cleveland, O. FREDERICK E. TUCKER, Weirton Steel Company, Weirton, West Va., and ARTHUR EPSTEIN, The Beryllium Corporation, Hazelton, Pa., Co-chairmen.

A Practical Stack Sampling Procedure — J. F. STEPHENS, General Motors Corporation, Detroit, Mich.

New Ideas in Air Monitoring — BENJAMIN LINSKY, Bay Area Air Pollution Control District, San Francisco, Cal.

Air Pollution as Determined by Corrosion Rates in Test Materials — W. C. GALEGAR and R. O. McCALDIN, Robert A. Taft Sanitary Engineering Center, U. S. Public Health Service, Cincinnati, O.

The Use of Natural Airborne Radioactivity to Evaluate Filters — C. L. LINDEKIN, Lawrence Radiation Laboratory, Livermore, Cal.

High Temperature Filter Media Performance with Shock Wave Cleaning — C. E. BILLINGS and LESLIE SILVERMAN, Sc.D., Harvard School of Public Health, Boston, Mass.

Calculating Oxides of Nitrogen Emission from Combustion Processes from Fuel Consumption or Exhaust Gas Volume — P. F. WOOLRICH, Robert A. Taft Sanitary Engineering Center, U. S. Public Health Service, Cincinnati, O.

Analysis of Hydrocarbons from Incinerator Effluents with Combustible Gas Indicator — MILTON FELDSTEIN, Bay Area Air Pollution Control District, San Francisco, Cal.

Non-Clinical Criteria of Toxic Exposure to Air Pollutants — CHARLES W. LaBELLE, Ph.D., Jefferson Medical College of Philadelphia, Philadelphia, Pa.

Concurrent Session — CHEMICAL AND ANALYTICAL

EVAN E. CAMPBELL, Session Arranger.

III. Gas Chromatography in Industrial Hygiene

RALPH G. SMITH, Ph.D., Associate Professor, Chairman; Department of Industrial Medicine and Hygiene, College of Medicine, Wayne State University, Detroit, Mich.

(A series of invited papers on gas chromatography will be presented. These papers are timely because of the tremendous interest in this field.)

PAUL F. URONE, Ph.D., University of Colorado, Boulder, Col. Dr. Urone will discuss the theory of the chromatograph, and relate some of the newer techniques and principles developed in his laboratory as applied to industrial hygiene.

NATHANIEL BRENNER, Ph. D., Perkin-Elmer Corporation, Norwalk, Conn. Dr. Brenner will discuss the recent developments and application of the chromatograph to industrial hygiene.

ROBERT F. PERO, Virginia Department of Health, Richmond, Va. Mr. Pero will discuss the practical application of gas chromatography in the field. The experiences gained by a three-year applied program of gas chromatography will be illustrated.

R. H. MANSUR, Virginia Department of Health, Richmond, Va. Mr. Mansur will summarize the preceding discussion and point out the area where gas chromatography needs further research and development. The moderator will preside over the question period.

IV. Field Analysis and Detection Instruments in Industrial Hygiene

ROBERT G. KEENAN, Chairman; Occupational Health Field Headquarters, U. S. Public Health Service, Cincinnati, O.

An Improved Continuous Internal-Electrolysis Analyzer for Gaseous Fluorides — O. W. HOWARD and C. W. WEBER, Union Carbide Nuclear Company, Oak Ridge, Tenn.

M. S. A. Billionaire — J. P. SHERWIN, K. E. BELL and J. P. STRANGE, Mine Safety Appliances Company, Pittsburgh, Pa.

Gas Titration of Air Contaminants — DeWITT HUFFMAN, Ohio Industrial Commision, Division of Safety and Hygiene, Columbus, O.

Concurrent Session — RADIATION

FRANK L. PASCHAL, Jr., Session Arranger; Convair, Fort Worth, Texas.

Health Aspects of the Commercial Melting of Radium-Contaminated Ferrous Metal Scrap — J. W. McKELVEY, National Lead Company, Cincinnati, O.

Management of Air-Borne Wastes in a Nuclear Economy - The Role of Meteorology — D. H. PACK, Sc.D., U. S. Weather Bureau, Washington, D. C.

Facility for Incineration of Combustible Waste Containing Radioactive Carbon — V. E. LAVETTER, Detroit Department of Health, Bureau of Industrial Hygiene, Detroit, Mich.

Stack Gas Beta Monitor — W. H. RAY, General Atomics, San Diego, Cal.

Medical-Legal Public Health Aspects of Nuclear Incident Investigations — A. F. MEYER, Jr., U. S. Air Force, Omaha, Neb.

Concurrent Session — TOXICOLOGY

NORMAN G. WHITE, Ph.D., Session Arranger; Shell Chemical Corporation, New York, N. Y.

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portunity to discuss miscellaneous information of common interest with fellow workers. Little pearls of wisdom are frequently disclosed in small groups, in the lobby, or in smoke-filled rooms over cocktails.

At the Detroit Meeting in April we are going to attempt to make this type of information available to everyone in the concurrent session on toxicology on Wednesday afternoon. For want of a better name we shall call it the Toxicology Fish Bowl—we are really "going fishin" for unpublished and never would be published information.

THURSDAY, APRIL 13
Concurrent Session — NOISE

A. L. CUDWORTH, Session Arranger; Liberty Mutual Insurance Company, Hopkinton, Mass.

MERLE LAWRENCE, Ph.D., University of Michigan Medical Center, Ann Arbor, Mich., and GEORGE L. BONVALLET, Rysdon Products Company, Chicago, Ill., Co-chairmen.

Correlation of Individual Job Noise Exposures with Audiometric Findings — E. J. SCHNEIDER, Dow Chemical Company, Midland, Mich.

Noise and Zoning — F. E TUCKER, National Steel Company, Weirton, W. Va.

Noise Measuring Instruments — G. KAMPERMAN, Bolt, Beranek and Newman, Chicago, Ill.

A Continuous Time Distribution Noise Level Meter — HAROLD CROUCH, Eastman Kodak Company, Rochester, N. Y.

Concurrent Session — TOXICOLOGY

NORMAN G. WHITE, Ph.D., Session Arranger; Shell Chemical Corporation, New York, N. Y.

Maximum Allowable Concentrations (MAC's) of Mixtures — HERVEY B. ELKINS, Ph.D., Director, Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, Boston 10, Mass.

The Metabolic Oxidation of the Amine Group in Aromatic Amine Bladder Carcinogens — WALTER TROLL, Ph.D., SIDNEY BELMAN, Ph.D., Institute of Industrial Medicine, New York University, New York City.

Acute and Subacute Effects of Nitro Olefines — WILLIAM MacDONALD and WILLIAM B. DEICHMANN, Ph.D., University of Miami, Coral Gables, Fla.

Lung Clearance in Dogs Using Radio Isotopes and Utilizing External Measurement Technics — University of Rochester, Rochester, N. Y.

Toxicological Studies of Acrylonitrile, Adiponitrile and Beta, Beta-Oxydiproionitrile. III. (Two-year studies on rats.) — J. L. SVIRBELY, Ph.D. and E. P. FLOYD, Robert A. Taft Sanitary Engineering Center, Cincinnati, O.

Concurrent Session — AIR POLLUTION & ENGINEERING

M. F. CLAY, Session Arranger; General Electric Company, Cincinnati, O.

ROBERT T. PRING, Session Arranger; Dracco, Division of Fuller Company, Cleveland, O.

JOHN F. KNUDSEN, Co-chairman, Kennecott Copper Corporation, Salt Lake City, U. (Other to be announced later)

A Compact Cascade Impactor for Field Survey Work — MORTON LIPPMANN, U. S. Atomic Energy Commission, New York Operations Office, New York, N. Y.

Aerosols in Air-Conditioned Spaces with Up to 100% Recirculation — HOWARD E. AYER, Public Health Service, Occupational Health Research and Training Facility, Research and Technical Services Branch, Cincinnati, O.

Dust Control in the Asbestos Textile Industry — BENJAMIN F. POSTMAN, Employers Mutual Liability Insurance Company, New York, N. Y.

A Study of Beryllium Exposures at a Hydrodynamic Test Facility —RAYMOND O. CAMPBELL, Lawrence Radiation Laboratory, University of California, Livermore, Cal.

Air Flow Requirements and Carbon Monoxide Concentrations in Underground Parking Garages — G. M. HAMA, W. G. FREDRICK, Sc.D. and H C. MONTEITH, City of Detroit Department of Health, Detroit, Mich.

Planning Ventilation for Nuclear Reactor Facilities — BRUCE J. HELD, U. S. Atomic Energy Commission, Idaho Falls, Idaho.

Industrial Hygiene Practice for Tunnelling in Compressed Air - A Study of Some Practical Problems — JERRY COHEN, City of Detroit Department of Health, Detroit, Mich.

Concurrent Session — CHEMICAL AND ANALYTICAL

EVAN E. CAMPBELL, Session Arranger.

V. Sample Collection Methods and Techniques

WILLIAM H. HILL, Ph.D., and JACOB CHOLAK, Kettering Laboratory, Cincinnati, O., Chairmen.

Use of Activated Charcoal in Air Sampling — WILLIAM H. REVOIR, Jr., American Optical Company, Southbridge, Mass.

Analytical Aspects of the Use of Various Filter Media — J. B. PATE, GEORGE HEGGEN and E. C. TABER, Department of Health, Education and Welfare, U. S. Public Health Service, Cincinnati, O.

Samples Collection Techniques for Combustion Sources, Benzopyrene Determination — R. L. STENBURG, R. P. HANGEBRAUCK and D. J. Von LEHMDEN, Department of Health, Education and Welfare, U. S. Public Health Service, Cincinnati, O.

Evaluation of Air Sampling Equipment — K. E. FOSTER and C. D. ROBSON, Department of Health, Education and Welfare, U. S. Public Health Service, Cincinnati, O.

Process Stream Analysis in Making Known Concentrations — H. N. COTABISH, R. W. McCONNAUGHEY and H. C. MESSER, Mine Safety Appliances Company, Pittsburgh, Pa.

Analysis of Lung Dust — N. A. TALVITIE.

A Routine Analytical Method for the Determination of Beryllium in Air Samples — R. A. HISER, H. M. DONALDSON and C. W. SCGWENZFEIER, Brush Beryllium Company, Elmore, O.

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Concurrent Session — TOXICOLOGY

NORMAN G. WHITE, Ph.D., Session Arranger; Shell Chemical Corporation, New York, N. Y.

Toxicology of Indium — University of Rochester, Rochester, N. Y.

Recent Studies on Mercury Vapor Exposures — University of Rochester, Rochester, N. Y.

The Respiratory Response to Zinc Ammonium Sulfate — MARY O. AMDUR, Ph.D., School of Public Health, Harvard University, Boston, Mass.

Experimental Basis for Selection of T.L. of Calcined Diatomaceous Earth — W. D. WAGNER, T. G. WRIGHT, N. A. TALVITIE, D. A. FRASER, O. J. DOBROGORSKI and H. E. STOKINGER, Ph.D., Occupational Health Field Headquarters, PHS, Cincinnati, O.

Aerosal Research in Western Europe — PAUL E. MORROW, Ph.D., University of Rochester, Rochester, N. Y.

Concurrent Session — NOISE

A. L. CUDWORTH, Session Arranger; Liberty Mutual Insurance Company, Hopkinton, Mass., ROBERT L. YOUNG, Employers Mutual of Wausau, Wausau, Wis., and GEORGE M. WILKENING, Esso Standard Oil, Linden, N. J., Chairmen.

Noise Control in the Steel Industry — J. H. BOTSFORD.

Noise Control in the Wood Products Industry — W. J. WOLF, Liberty Mutual Insurance Company, San Francisco, Cal.

Noise Control in Business Machine Rooms and Manufacturing Operations — C. G. EASTER, Steel Company of Canada, Hamilton, Ont.

Noise Control in Gas Turbine-Powered Compressor Plants — ALTON H. DISERENS, Creole Petroleum Corporation, Caracas, Venezuela.

Noise Control in Pneumatic Tools — R. J. WALDRON, Chicago Pneumatic Tool Company, Utica, N. Y.

Concurrent Session — RADIATION

FRANK L. PASCHAL, Jr., Session Arranger.

Radiation Alarm Pedestal — W. H. RAY.

Radiation Dose Received by Passengers and Crew on Planes Carrying the Maximum Number of Radiation Units — D. M. DAVIS, Oak Ridge National Laboratory, Oak Ridge, Tenn.

A New Technique for Evaluating Respirator Performance — W. A. BURGESS, General Electric Company, West Lynn, Mass.

Use of Statistical Methodology in Environmental Monitoring — G. W. KERR, Pratt and Whitney, Middleton, Conn.

Concurrent Session — CHEMICAL AND ANALYTICAL

EVAN E. CAMPBELL, Health Division, Session Arranger.

VII. Panel Discussion of Field Indicators in Industrial Hygiene

LESLIE SILVERMAN, Sc.D., Chairman; Harvard University School of Public Health, Boston, Mass. (The discussion will include gas, vapor and particulate detectors; theory, evaluation, limits, new techniques and needs of the detectors. The manufacturers have been asked to assist in answering specific questions directed toward them concerning their products.)

O. M. BANKS, Shell Chemical Company, Houston, Tex. Evaluation of commercial field indicators. An original paper which includes the evaluation of the detectors based on manufacturers' recommended field procedures.

NEWTON KETCHAM, Union Carbide and Carbon Chemical Company, South Charleston, W. Va. Practical experiences and value of the detectors in the field; related techniques.

DR. CRAMER, U. S. Army Chemical Warfare Laboratory, Edgewood, Md. New techniques applicable to detector systems; chemical and instrumental changes.

BERNARD E. SALTZMAN, Department of Health, Education and Welfare, U. S. Public Health Service, Salt Lake City, Utah. Fundamental principles of the detectors and what may be expected from present systems; new chemical reactions that may be applicable.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

MONDAY, APRIL 10

The Health Director: Federal-State-Local — ALBERT E. HEUSTIS, M.D., State Health Commissioner, Michigan Department of Health, Lansing, Mich.

The Physician: Socioeconomic Relationships — C. JOSEPH SETTLER, Director, Legal and Socioeconomic Division, American Medical Association, Chicago, Ill.

Management: Community Effort and Benefits — FRED W. HENDERSON, Assistant Vice President, Western Electric Company, Winston-Salem, N. C.

Employees: Responsibilities and Privileges — GEORGE T. BROWN, Executive Secretary, Standing Committee on Safety and Occupational Health, AFL-CIO, Washington, D. C.

Radiological Health

United States Atomic Energy Commission Program — G. W. MORGAN, Chief, State-AEC Relations Branch, AEC Office of Health and Safety, Germantown, Pa.

United States Public Health Service Program — F. J. WEBER, M.D., Chief, Division of

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Radiological Health, Office of the Surgeon General, USPHS, Washington, D. C.

Military Programs Related to Civilians and Civilian Activities — MAXWELL DAUER, Lt. Colonel, MSC, Chief, Radiological Hygiene Division, U. S. Army Environmental Hygiene Agency, Army Chemical Center, Md.

The Federal Radiation Council — DONALD R. CHADWICK, M.D., Secretary, Federal Radiation Council, Washington, D. C.

Small Occupational Health Programs

Enlisting the Physician — CHRISTINE EINERT, M.D., Committee on Industrial Health, Alameda-Contra Costa Medical Association, Berkeley, Cal.

Evaluating Program Progress — E. J. BAIER, Chief, Industrial Hygiene Section, Division of Occupational Health, Pennsylvania Department of Health, Harrisburg, Pa.

TUESDAY, APRIL 11
Roundtable Discussions

Chemists — ROBERT C. KEENAN and Lt. Col. MAXWELL DAURER.

Engineers — ROBERT L. HARRIS, JR. and GEORGE M. HAMA.

Nurses — MABELLE J. MARKEE and ESTHER W. KILMER.

Physicians — ROBERT H. FLINN, M.D. and C. P. McCAMMON, M.D.

The University of Miami School of Medicine has received more than $60,000 from pharmaceutical concerns and professional organizations to help Cuban physicians in a special postgraduate refresher course in medicine.

D. JOHN LAUER, M.D., Medical Director, The International Telephone and Telegraph Company presented $40,000 from the Company to DR. JAY F. W. PEARSON, President of the University, and to DR. RALPH JONES, JR., Professor and Chairman of the Department of Medicine. DR. JONES, organizer of the postgraduate program, stated that the funds would be used to provide scholarship assistance, faculty stipends, textbooks, and bilingual equipment.

The Mead Johnson Company has contributed $10,000 in the form of ten scholarships to Cuban physicians to permit them to study and teach in the medical school.

The American College of Surgeons has made a special fellowship award of $6,000 to Dr. Jose Lastra, Professor of Surgery at the University of Havana School of Medicine, and a governor of the American College of Surgeons. DR. LASTRA has now been named Visiting Professor of Surgery at the University of Miami.

A contribution of $5,000 has been received from the Educational Council for Foreign Medical Graduates, an organization formed by the American Medical Association, the American Hospital Association and the Association of American Medical Colleges.

A large supply of American medical textbooks, translated into Spanish, have been supplied by the W. B. Saunders Company, medical publishers. More textbooks and additional funds are still needed, since most of the 265 Cuban physicians taking the course in Miami are virtually destitute.

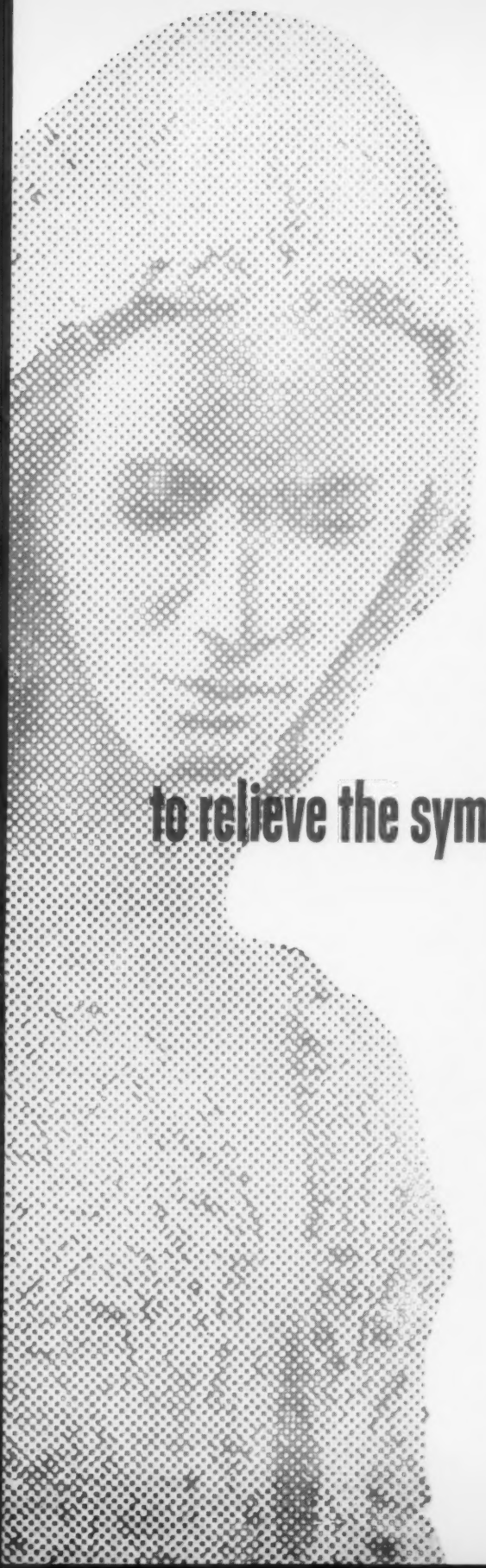
The course, which began on January 9, provides free of charge a three month intensive program in both basic science and clinical subjects. Members of the University of Miami faculty and of the University of Havana faculty are collaborating in teaching the course. Large lectures and small tutorial sessions cover all aspects of medicine.

General supervision of the course is in the hands of DR. JONES, with the assistance of DR. JOSE CENTURION, Professor of Medicine and Chairman of the Department at the University of Havana, DR. EMIL TAXAY, Instructor in Medicine, University of Miami, and a staff of 80 faculty members drawn from both universities.

At the conclusion of the three month course, most of the Cuban physicians plan to take the examination given by the Educational Council for Foreign Medical Graduates. Passing this test will enable them to work as interns and residents in U.S. hospitals. In some states they would also be allowed to take state examinations for medical licenses to practice.

—UM Photo by David Greenfield

Coral Gables, Fla. — DR. C. DOREN THARP (right), Vice President and Dean of Faculties of the University of Miami, smiles as he accepts a $40,000 check from D. JOHN LAUER, M.D., Medical Director of International Telephone and Telegraph Company, to help underwrite a three month postgraduate course at the University of Miami School of Medicine for nearly 300 displaced Cuban physicians. At the left is RALPH JONES, JR., M.D., Chairman of the Department of Medicine of the Medical School.



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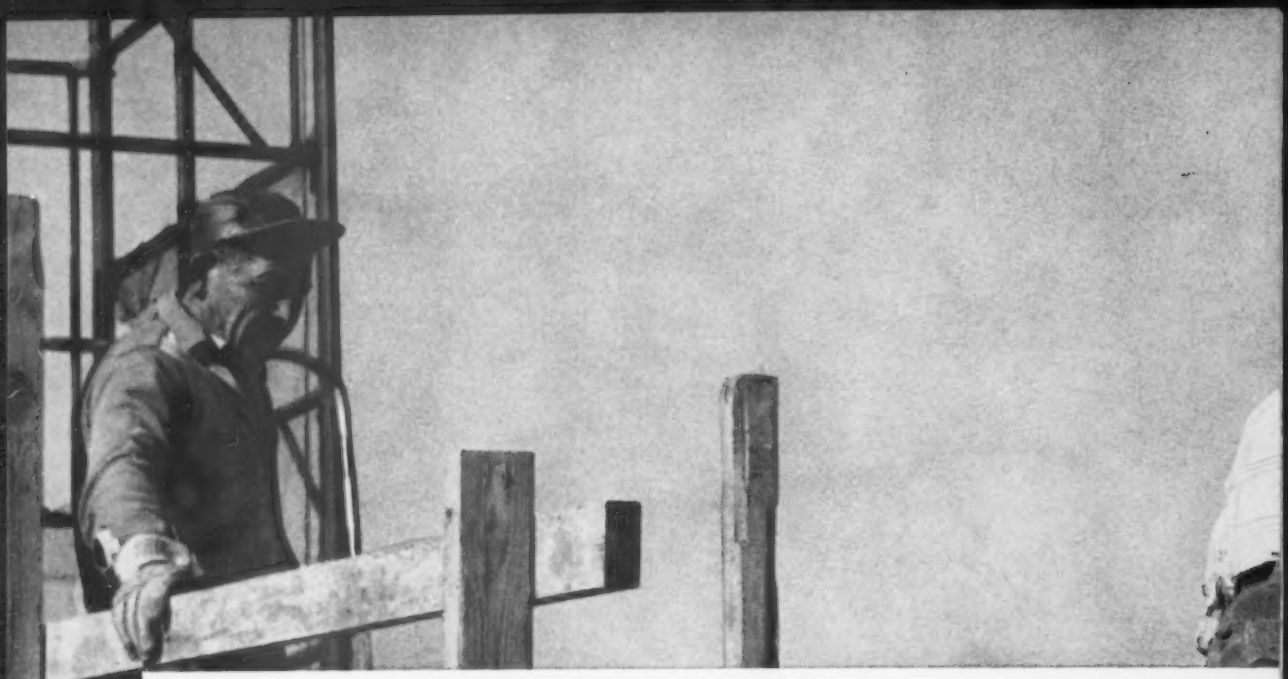

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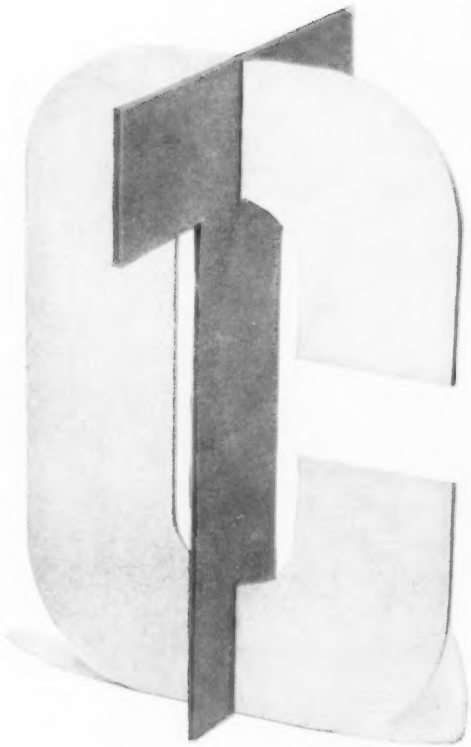

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1. Crawford, O. B.: Anesthesiology 14:278, 1953. 2. Wiedling, S.: Xylocaine, The Pharmacological Basis For its Clinical Use, Stockholm, Almquist and Wiknell, 1959.

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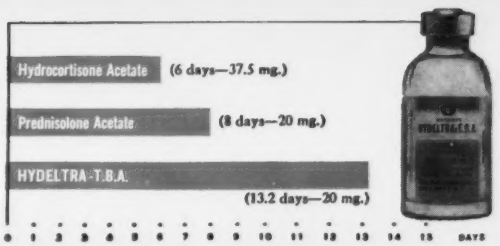
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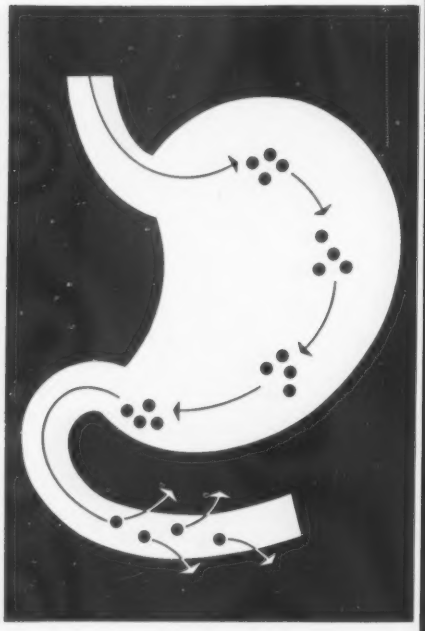

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1. Griffith, R. S.: Antibiotic Med. & Clin. Therapy, 7:320, 1960.

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GRANULOMATOUS INFLAMMATION OF THE BURSAE

• JOHN E. KIRKPATRICK, M.D.
San Francisco, California

Significant trauma to the elbow can cause dislocation or fracture of one or more components of this joint and result in considerable permanent disability. The healing process under effective management normally progresses steadily toward absorption of hemorrhage and edema, reunion of torn ligaments and fractures, and restoration of the smooth gliding tissues, the synovia, the bursae. Whatever permanent disability occurs does not result in the development of "tennis elbow," "calcium deposit," bursitis, tenosynovitis, rheumatoid arthritis, or osteoarthritis. Most important of all, significant trauma does not produce any known inflammatory condition of the epicondyles of the humerus that can be proved by surgical exploration or microscopic examination of a biopsy of the epicondyle, or that can be visualized by roentgenograms.

After an injury such as this there may be some permanent restriction of elbow motion due to ordinary scar tissue in the ligaments, but such a severe injury does not result in the development of ganglion, chronic villous tenosynovitis, bursitis, or calcific densities in the bursae, or stenosing tenosynovitis, or the carpal tunnel syndrome, or rheumatoid arthritis, or osteoarthritis.

Localized joint pains, referred to by such misnomers as "Tennis Elbow," "Carpal Tunnel Syndrome," "Weaver's Hand," and "Calcium Deposit," are often blamed on trauma and occupational exposure. The author takes a critical look at the evidence.

The development of these diseases has often been reported as owing to a tear in a ligament of the elbow, bruises, bumps, occupational activity, repetitive motions, use of small hand tools, occupational microtrauma, overstretching of the muscles, exposure to cold, and many other extrinsic things.

A complication, occasionally seen after a Colles fracture, may occur — and that is that after about six weeks there may be a sudden rupture of the extensor pollicis longus tendon in its osseofibrous tunnel. The pathological process involved in this complication is ischemic necrosis of the tendon, due to prolonged edema in its narrow compartment. Microscopic examination of the ruptured ends of the tendon in such cases does not reveal any evidence of granulomatous inflammation, but only simple tendon necrosis. This complication is not due to one of the chron-

ic tendon or tendon sheath diseases caused by granulomatous inflammation. However, spontaneous rupture of a tendon without significant trauma is always due to one of the granulomatous inflammations.

The Dogma of Trauma

Let us weigh the dogma of trauma as a cause of several common entities against the facts of granulomatous inflammation involving the extremities.

A ganglion is often the first manifestation of degenerative disease of the ligaments of the wrist, hand, ankle, or foot. It usually makes a gradual appearance and pain is noticed if the area is struck; most frequently it is not noticed until some occurrence brings it to the attention of the patient. It cannot be produced by lacerating the carpal ligament, or by surgical incision through the ligament. As a matter of fact, cure of it is effected by complete excision of the degenerated area of the carpal ligament, together with the ganglion. Here, then, significant trauma (surgical) cures a condition presumed to be caused by trauma, a paradox. Recurrence of the ganglion in the same place is due to lack of complete excision of the degenerated portion of the carpal ligament causing the ganglion.

Taking into consideration the four moving extremities of each normal person, and the use and abuse they take in sports or work, the proportion of persons who have this disease is almost infinitesimal considering these four parts which are exposed daily to so-called microtrauma. Why perform surgical operation, a maximal trauma, if minimal trauma can cause this condition? Before surgical procedures were perfected for this condition, it was common practice to pound the ganglion with a book to rupture it.

A collection of fluid in a tendon sheath is not a ganglion. Following significant trauma, either hemorrhage or a serous effusion may occur. This condition runs a normal course of absorption, which may be aided by aspiration with a needle; it does not recur at intervals and does not become chronic. Where an effusion in the tendon sheath does persist, or recur, then the diagnosis that it was of traumatic origin becomes suspect. The pathological reason for chronic tenosynovitis with effusion is that it is one of the granulomatous inflammations, currently classified as one of the rheumatic diseases. Crepitating, or villous tenosynovitis, with or without "rice bodies" (not due to tuberculosis or to any known animate agent) is due to one of the inanimate (chemical or physical) agents, the more common ones being cholesterol, uric acid or rheumatoid factor, singly or in mixed lesions.

A granulomatous inflammation now thought to be produced by collagen (inanimate agent) is Dupuytren's contracture of the palmar or plantar fascia (also Peyroni's disease, and probably torticollis).

Dupuytren, a French surgeon, described this condition first in 1831. It affects less than 2% of the adult population, and occurs chiefly in men. It is seldom seen in Negroes or in Indians. Most persons who have it are unaware of the early manifestations of this disease unless they experience an acute inflammatory attack in one or more nodules of the fascia, accompanied by tenderness and redness of the overlying skin.

The acute inflammatory phase of this disease is characterized by pain, redness of the skin, and localized swelling over the area of the involved palmar fascia. It may be the first attack before fibrosis of the fascia has developed. It can occur also as an acute exacerbation of the disease in advanced fibrosis of the palmar fascia which has already produced contractures.

Recent microscopic sections of palmar fascia which I have obtained surgically during the acute inflammatory phase of Dupuytren's disease reveal an acute vasculitis.[1]

Although a therapeutic dose of x-ray can cause the inflammatory reaction to disappear promptly, its use on the hand is frowned upon except in individuals whose life expectancy is not more than 20 or 30 years because of the latent carcinogenic effect of skin radiation. The effect of x-ray therapy on the acute stage of vasculitis does not retard the progression of fibrosis and contracture of the diseased palmar fascia.

Following the injury of a hand or wrist requiring a few weeks of bandaging or being in a plaster cast, the patient may suddenly discover the condition and honestly believe he never had it before because he has been unable to appreciate that it had begun insidiously several years previously. In such cases it usually can be found, in one stage or another, in the uninjured hand. It is most often bilateral and may be more advanced in one hand than the other. The major hand is not always involved to a greater extent than the opposite.[2]

Gout is a systemic disease due to an inborn inability to excrete uric acid normally. Approximately a half million Americans are afflicted with some form of gout. A common misconception of manifestations of gout is that it only occurs in the great toe, or that tophi can only be found in the ears. This granulomatous inflammation caused by uric acid (inanimate agent) can manifest itself in any joint and in any bursa or synovial space (as well as many other parts and organs of the body including the heart and the entire vascular system).[9] In those afflicted with tophaceous gout, uric acid deposits are found in

one or multiple locations, commonly subchondral areas adjacent to the collateral ligaments of joints, and in bursal and synovial spaces. Such a deposit in one of these areas may form a weeping sinus through the skin, which is seen most frequently in the digits but sometimes in the skin over the olecranon bursa. Gouty periarthritis may be confused with other forms of arthritis.

If an acute inflammatory episode occurs, which responds to adequate dosage of colchicine, it is certainly very likely acute gout; if the patient does not remember, or does not wish to remember, any previous attacks, it may be the first attack. Occasionally gout is associated with the granulomatous inflammation of rheumatoid arthritis, the cause of which is unknown, but recently has been associated with the rheumatoid factor (inanimate agent).

Direct significant trauma to a subcutaneous bursa usually ruptures the bursa lining and the sac fills with blood. This resolves with, or without aspiration in a short period of time and does not recur or become chronic. It can occur again after another trauma, but a new hemorrhage cannot occur spontaneously without bursting of a blood vessel. An acutely swollen bursa with warm red skin overlying it is most frequently caused by the granulomatous inflammation of uric acid, cholesterol or both, and is not due to "think back" trauma, or "must have bumped it" trauma. In bursitis of this type, microscopic studies of the lining of the bursa prove the diagnosis. Specific therapeutic treatment causes the inflammatory reaction to subside rapidly. Opacities seen in x-ray films of these areas often are reversible by systemic medication.

Adventitious bursae can be caused by specific repeated occupational trauma (as in hod-carrying, hardwood floor laying) but these bursae do not develop granulomatous inflammations.

This question has always been helpful when making a diagnosis: What would you, as a physician, expect would happen following a certain describable trauma; and, drawing on your experience in many similar cases, what has been the effect of this type of trauma on the part so injured?

It is doubtful if any physician would subscribe to a statement that a blow that fractured ribs over the heart could cause rheumatic endocarditis. However, there are many who will subscribe to a statement that a severe blow or even a single minor one, or constant minor trauma, in the region of a joint can cause the development of some chronic condition, whatever it may be — bursitis, epicondylitis, tenosynovitis, calcific tendonitis,[3] gouty periarthritis, rheumatoid or degenerative arthritis.

The accepted medical dictionary definition of "tennis elbow" is an acute or chronic synovitis of the radial humeral bursa.[4]

Barritt[5] said that a physician should render a medical opinion based on *reasonable medical probabilities.* (Be it noted he did not say *possibilities.*)

It takes more mental energy to think about the role of the reticuloendothelial cells, and their proliferative reaction which displaces normal cells in tissues in granulomatous inflammatory disease, than to accept common offhand epithets such as "wear-and-tear" or "microtrauma" in the etiologic description of these conditions. Forbus[6] suggested that a further understanding of the granulomatous inflammatory reaction may lead to a solution of the cause of genuine neoplasia.

There are a number of other conditions which have been blamed on trauma, among them xanthoma of tendons, which is caused by a hypercholesteremic familial metabolic disorder; spontaneous rupture of tendons in their osseofibrous tunnels from rheumatoid arthritis; peripheral median nerve neuritis due to rheumatoid, or other types of tenosynovitis of the flexor tendons in the carpal tunnel; trigger finger; DeQuervain's disease; nonosteogenic fibroma of bone; and Heberden's nodes.

Granulomatous inflammation can be produced by many agents, but not by trauma — by animate agents such as bacteria and coccidia; or by silica, fats and oils, collagen, cholesterol, uric acid, rheumatoid factor, Bence-Jones protein; or by unknown agents, as in Hodgkin's disease, rheumatic fever, mycosis fungoids, and sarcoid of Boeck.[6]

Some of the more common types of disease affecting the extremities during the years of employment are fibrositis, myositis, bursitis and so-called epicondylitis, ("tennis elbow"),[7] which affect only a small proportion of the 11 million Americans afflicted with arthritis and related rheumatic diseases. Some of these conditions run a course independent of treatment, and some of the effects of the disease are reversible without treatment. Most of them have a tendency to recur at more or less frequent intervals, or to be chronic. None of the rheumatic diseases or granulomatous inflammations presented here as examples have ever been created by slight or severe mechanical trauma either in experimental animals or in human beings.

One recent article on the "carpal tunnel syndrome" stated that division of the carpal ligament in 16 cases afforded "immediate and lasting relief," from the symptoms. It is amazing to read further and find this statement, "In every instance the (flexor) tendons were covered by

an abnormally thick sheath of material, *the nature of which is not known.*"

This condition, "the nature of which is not known," is too often generally ascribed to trauma, repetitive motions, or some similar unscientific etiology. The condition is most commonly due to one of the rheumatic diseases producing a tenosynovitis; it is caused frequently by the rheumatoid factor and less commonly by gout or cholesterol granulomatous inflammation.

These diseases are associated with dysfunction of the reticuloendothelial system, and trauma does not produce a persistent stimulative effect on the cells of the reticuloendothelial system. The course of the granulomatous inflammations is toward chronicity and recurrence. These lesions may be reversible, may end in scarring, or may cause total progressive dissolution of tissue or total destruction of the individual.

The problem lies not so much in a lack of pathological reasoning and understanding as in specious socioeconomic reasoning — almost as if when a patient says something is so, his physician must say it is so in order to keep out of an argument that may affect his economic status and thus avoid conflict with the patient, a labor union or the patient's employer. It is granted the impact of such reasoning was greater during the earlier part of the past 50 years of the age of industry, for in those days there was limited insurance coverage, particularly for off-the-job occurrences. Now, with most industrial employees covered by an umbrella of insurance both on and off duty, fewer and fewer young physicians will be exposed to this unsound concept, and it is now more likely that the physician will be remunerated for services that once would not have been paid for if the condition were certified as not being industrially connected from the standpoint of scientific fact and probability.

When a patient who attributes a disease of the extremities to on-the-job trauma is found, upon physical examination, to have one of the granulomatous diseases dealt with herein, rather than a "compensable" injury, the physician can do the patient a worthwhile service by making an accurate diagnosis and informing him of the real nature of his illness.

As Thannhauser said, "Every patient is a new experience and a challenge to the keenness of our senses."[8]

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Keep It Clean

Maintaining a high standard of housekeeping cannot be overemphasized in the handling and storage of sensitive materials, the Manufacturing Chemists' Association states in the latest in a series of safety guide pamphlets.

The recently released pamphlet, SG-7, entitled "Recommended Safe Practices and Procedures — Storage and Handling of Shock and Impact Sensitive Materials," covers all such materials other than those classified as explosives. It stresses that many chemical substances, when stimulated by shock or impact, release sudden energy in the form of heat, or heat and gas, creating extremely hazardous conditions.

"Some of the 'sensitive chemicals' are used regularly in normal commercial channels and are widely known; others are less common and their use may be confined to experimental work," the pamphlet states.

The Association urges that definite areas of responsibility should be spelled out and posted in order that only those authorized and educated in safe handling procedures have access to the sensitive materials.

In making emergency or regular repairs on buildings in which these materials are stored it is important that maintenance crews should be provided with a clearance or permit, signed by "operating" supervision testifying that the building or equipment has been made safe for the work to proceed.

Other safety precautions include: use of spark-resistant tools, direction of all operations by qualified personnel, prevention of accumulation of sensitive waste material, isolation of processing area, and segregation of individual operations. In addition, particular attention should be given to protective equipment during repair or maintenance of facilities in areas where sensitive materials are stored or processed.

Of primary consideration in the manufacture of sensitive chemicals are two essentials for their safe storage and handling: development of written procedures to cover the whole operation from storage of original materials to shipment of finished product, and allocation of responsibility to ensure that there will be no deviation from this standard procedure.

Copies of SG-7 are available from the Manufacturing Chemists' Association, 1825 Connecticut Ave., N.W., Washington 9, D.C. for 20 cents per copy.

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MOTIVATING for Accident Prevention

Implicit in the title of this paper is the concept that people can be helped to conduct their lives in a safer or less accident ridden manner. As a psychiatrist, I am devoted to the concept that non-characterological disorders are treatable and that personalities — even those that are accident prone — can be changed.

At best, personality changes are difficult to accomplish, and the number of accident prone personalities is, indeed, staggering. Then, too, personalities do not change in a vacuum, but rather require interested and dedicated people who are willing to plan programs and to develop them. There are far too few such individuals involved in this type of work. However, despite the practical problems, there are some areas in which we can work toward motivating people to a state of better self-protection and preservation.

It does not seem necessary to review here the current statistics on accidents. They certify pressing need to involve the individual more intimately in his own protection. Safety devices on the highway or in industry, together with various educational programs, safety committees, and the like, have not done for the individual what one would like to see him do for himself. In a recent publication of the Washington Department of Labor and Industries it is stated that 85% of industrial accidents are due to human failure.[1] We must be aware that "human failure" is motivated and is difficult to reach in the educational program or in the safety device. I should like to discuss motivation from the point of view of the psychiatrist and to consider some factors in motivating for accident prevention.

When studying the question of accident prevention in industry, four words or phrases seem to stand out: fear motivation, education, rewards and responsibility, and supervision. I should like to discuss each of these.

Fear motivation as an aspect of accident prevention leaves much to be desired. As long as an individual is fairly well adjusted emotionally and is not depressed, it is difficult for him to feel that the unfortunate experience of another or even that the potential danger inherent in a situation could apply to him. Rather, he is more likely to feel, "It can't happen to me, it hasn't, and it won't." The story told in the fear motivating effort is always that which happened to another because of his "sloppiness, laziness, or stupidity." Often the fear motivation leads to a kind of lethargy promoted by the aggressiveness of the person who looks on this attempt at accident prevention as trite or immature.

Much has been said about "goals and rewards," and that which is closely allied, "responsibility." Psychologically, the giving of rewards or the placing of responsibility in the hands of some is helpful, but only in those instances where there are personality needs which require this type of satisfaction. We recognize that there are certain personalities that need to serve others, some which need to assume responsibility, particularly with a kind of aggressiveness in the responsibility, and, then, there are others that obviously respond well to praise. Rewards and/or responsibility may be helpful at times, particularly if the instances are well chosen and in keeping with the particular personality pattern of the individual.

Education is a part of every safety campaign. Education is like good weather; we are always in favor of it! Also like the weather, there are many factors involved. To oversimplify a large subject, education requires at least two personalities: one with the ability and willingness to teach, and the other with the ability and willingness to learn. Given two children in a certain classroom, with comparable abilities to learn, one does well and the other does poorly. Why? The one who accomplishes has developed the basic relationship with his teacher on which the learning process can be accomplished. The other does not have this relationship and does not accomplish. In order for education to take place, the teacher and the student must have found a relatedness, a kind of understanding which comes only with the appropriate mixing and blending of personalities.

Then, there is the fourth word, "supervision," which means helping, teaching, supporting, understanding, and guiding. But, again, most important of all is the personality of the one who is to do the supervision. A supervisor needs a human quality which encompasses love, givingness, and yet strength.

Presented at the Governor's Safety Conference, Olympia, Washington, Nov., 1959.

Perhaps I can summarize what has been said and written on accident prevention in the past, in these few remarks: Personalities are all-important — personalities of the educators, the rewarders, and the supervisors as well as of the individuals to be taught, rewarded, and supervised. Basically, the great need is an ability to understand and relate to others.

Research on accidents is not plentiful and what we have is not too productive. However, there are a few points on which we can speak with confidence. One of these is that accidents are not chance happenings. All behavior has a cause. In the final analysis, accidents have a large emotional or psychological explanation.

Another point which seems to be firmly established is that accidents tend to occur repeatedly in the same people. That is, certain people tend to be accident prone. An example of this is seen in the individual who was recently admitted to a surgical service for the fourth time, the cause of each admission being the result of an on-the-job accident. This phenomenon is also manifest in automobile accidents.

There seems also to be general agreement on the hostile component in accidents. To cut a finger, to break an arm, or to ram a car into someone is a pretty angry thing to do. This hostility, of course, may be expressed outwardly wherein someone else gets hurt, or inwardly in a kind of self-inflicted punishment.

I recently read about a man who was waiting in his car while his wife opened the garage door. The car began to roll backward. He "accidentally" stepped on the accelerator and since the car was in low gear, it lunged forward, crushing his wife against the garage door and killing her instantly. The gentleman was, naturally, quite distressed. His discomfort, psychologically speaking, was the result of guilt feelings, for he had been angry with her for a long time. Unconsciously, he longed for her destruction. The "accident" accomplished the desired wish.

Karl Menninger relates an example of self-inflicted hostility.[2] He refers to a man who decided that too many of his chickens were being stolen. ". . . He contrives a burglar trap so that if anybody comes in, he'll be taught a lesson. He will be shot by a gun triggered by opening the door. He erects it. He sets it. He retires. And then, he forgets!"

We have discovered from practical experience that little is known about how to handle this hostility; warnings have not been heard; legislative action — regulations, jail and even capital punishment — have been to little avail.

If we hope to motivate toward accident prevention, we must begin to consider the psychological problems of the people who have the accidents. This is to say that perhaps the next approach to the ever present problem should be one which singles out the more serious cases and attempts to understand and to treat them. While this is at once both nebulous and gigantic, the problem is somewhat simplified by the already expressed fact that most accidents tend to occur in the relatively few who have repeated episodes of difficulty. The group is further defined by the fact that the accident prone are more likely to be in the aggressive segment of our population, since the more withdrawn and compliant individuals tend to repress their hostilities more effectively. While this does not simplify the magnitude of the problem, it does mean that the understanding of the dynamics needed is somewhat more comprehensive.

Let's look at it this way. Anger is caused. Usually it is the result of a clash of ideas, hopes, or plans, that induces a sense of frustration. Individuals who are acquainted with this feeling tend to be insecure, with the result that they are troubled with hostility.

For this basically hostile individual to continue to meet frustration only perpetuates the problem. Experience has shown him to be incapable of effectively handling his feelings. He has only two ways to move: toward an accident, which we hope to prevent, or, toward a more acceptable method of dealing with his problem. One effective method, used every day, is to communicate one's feelings — the insecurities, doubts, anger, and fears — to a friendly and interested listener. To be heard, understood, and to be appreciated as a troubled person, difficult as this may be to accomplish, is certainly to remove oneself from the need to act out one's anger in an accident.

Counselors, whether medical, psychiatric, psychological, or social, represent the hope in the future in accident prevention. They may provide the opportunity for the basic relationship necessary before learning and supervision can take place. They are capable of providing the interested and supporting listening so necessary in relieving the basic anger which is frequently the cause of accidents. They can serve as the avenue for the appropriate handling of emotional problems.

Agencies concerned with accident prevention are spending tremendous amounts of money. Counseling programs may not add appreciably to the financial burden, and may provide the missing link in the program for effective accident prevention.

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BYSSINOSIS – a review

Introduction

For over 100 years, it has been recognized that cotton workers have suffered unduly from chronic respiratory disease, presumably from the inhalation of dust. A disease, now called byssinosis, also has been described in other textile workers — i.e. hemp and flax workers. The disease has been noted in many countries in many decades and hence many different names have been attached to it. For examples, in 1827, Gerspach in France described what was called "tracheal phthisis"; in 1831, Kay, a physician in Manchester, England, described what he called "cotton spinners' phthisis." Some other names by which this entity was known include "cotton pneumonia," "occupational bronchorrhea," "industrial phthisis," "strippers' and grinders' asthma," "cotton mill asthma," and others.

Despite numerous surveys, investigations, and studies, the mechanism of the production of this disease has not been determined, although it has been attributed to the inhalation of cotton dust. Though only a small percentage of workers in the cotton textile industry is exposed to a serious dust hazard, because of the great number of workers in this industry the extent of the problem becomes worthy of consideration.

Cotton Processing

Before proceeding further, a brief summary of the various steps involved in cotton processing may be helpful.

In harvesting, the cotton fiber with its attached seeds is separated from the cotton plant, either by hand or machine. This is, of course, done out of doors and there is no apparent dust hazard. The next process is ginning, which is the separation of the seeds from the cotton fiber or lint. The lint is what is used in the textile industry. The seeds are processed for their oil content. Ginning is a dusty process but is seasonal and therefore not of long duration. After ginning, the cotton fiber or lint is then compressed into bales that are covered with burlap and tied with steel bands. These bales are then shipped to the cotton mills.

At the cotton mill, the bales are opened in the cotton or mixing room. There, by mechanical means, the hard matted layers are converted into a loose fluffy mass. In the blowroom, dust and short fibers are beaten and blown out of the cotton. The cotton and blowrooms are dusty. The fibers are then advanced to the cardroom where they are combed and straightened by carding, which removes more of the dirt and defective material. The fibers are then gathered into a thick strand of cotton, which is drawn out on other machines in the cardroom into finer strands or rovings ready for spinning. The cardroom has nothing to do with cards in the paper sense. Rather, the name comes from the Latin *carduus*, meaning thistle, because originally, thistles were used to comb and straighten the fibers. Today, this is all done by machines. The carding machines consist of a large cylinder with steel spines or wires sticking out of it. Long bars, also with steel spines, face the cylinder. This cylinder revolves slowly and the cotton fibers are caught between these spines and pulled and straightened by them.

In the process of carding, the steel spines tend to become dull and bent, and the spaces between the spines become packed with dirt and short fibers. Consequently, the teeth or spines have to be sharpened and straightened, and the dust, debris, and fibers removed from between the teeth. This job is performed by workers known as strippers and grinders. This is the dustiest job in the entire cotton textile manufacturing process.

Occupational Diseases of Cotton Workers

There are four different disease pictures that occur in cotton workers which can be classified as occupational diseases. These diseases may or

may not be related, but in order to understand and interpret the literature a brief discussion of these different entities is indicated.

Mill Fever

This term, mill fever, was first used in the literature in 1892 in reference to exposure to flax dust. It was used again by Oliver (1902) and Collis (1913, 1914-15) specifically with regard to cotton dust. From the descriptions by these workers, this disease is characterized as occurring in those who have not previously been exposed to cotton dust, and by the development of a tolerance to the dust after a few days or weeks. A good description of this entity is that by Ritter and Nussbaum:[1]

> Among new employees working in cotton dust about 10 to 50% develop a definite chill. The onset of this condition may take place during work on the first day but it more frequently develops after the employee returns from work to his home in the evening. This chill is followed by a fever (100° F. to 103° F.) that is almost invariably gone by morning. A headache usually accompanies the fever. Occasionally there is a nosebleed or nausea, even vomiting. This identical experience may be repeated for the first several nights. Such repetition of a 'dust chill' is fortunately uncommon. For the next few nights this new employee usually has only a slight recurrence of the fever and a vast sensation of exhaustion.
>
> Usually by the end of the first week, but almost certainly by the end of the first month of employment, these symptoms no longer develop in the individual as long as he continues in the same job. If, during the first year of employment this individual should be away from work for about two weeks he will probably repeat this immunizing experience. This second bout of cotton fever is usually milder — seldom any chill or nausea, and temperature usually less than 100° F. Because of the mildness of the symptoms this recurrence is frequently overlooked. Older employees who may have spent many years at this type of work usually have to be away from the dust for a month or two before they need anticipate a recurrence.

Weaver's Cough

There have been several outbreaks of an acute respiratory illness, known as weaver's cough, occurring in workers in weaving sheds using mildewed yarn. The disease is characterized by constriction in the chest, difficulty in breathing which may resemble asthma, productive cough, malaise, headache, and fever. Upon removal from the sheds, there is rapid improvement. The causative agent of the illness was suspected to be a mildew (fungus).

Illness Associated with Low Grade Stained Cotton

There have been several outbreaks among workers handling dusty, low-grade stained cotton. In some outbreaks, hundreds of cases occurred but the outbreak stopped when protective respiratory apparatus was used by the workers or when a better grade of cotton was used. The clinical picture is characterized by fatigue and generalized aches beginning one to six hours after beginning work. This is followed by anorexia, headache, nausea, and vomiting. In some cases this is followed by chills and fever. The cotton associated with these outbreaks was found to be heavily contaminated with Aerobacter cloacae. Following experimental work, it has been concluded that the illness was due to endotoxins contained in the inhalated A. cloacae in the dust.

Byssinosis

The word byssinosis is derived from the Greek word for cotton or flax, and was first used around 1875. The definition of the word varies in different sources. Some dictionary examples include: "a form of pneumoconiosis occurring among cotton mill operatives" (Stedman, 1936) or "due to inhaling cotton dust in factories" (Dorland, 1941). In England, the report of the Departmental Committee for 1939[2] defines the term as follows:

> Chronic bronchitis, complicated by emphysema in its later stages and by asthma in some cases, has been unduly prevalent in card-room operatives. . . . The symptoms and signs of the disease as revealed by physical examination do not differ from those of bronchitis and emphysema as seen in the general population, but the clinical and industrial histories, taken in conjunction with the condition found on physical examination, are sufficiently characteristic to enable a properly constituted Medical Board to arrive at a definite conclusion that the disease is industrial in origin and due to the inhalation of cotton dust. . . . The connection of respiratory disease of the type we have been considering with certain forms of occupation concerned with textiles has been sufficiently recognized for the term 'byssinosis' to find its way into medical terminology, and we have used this term in the present report to describe the respiratory disease among cotton workers with which we are concerned.

There have been many descriptions of the disease in the literature, some as early as 1836. From these reports, it is apparent that the

authors were dealing with persons who were subject to heavy exposure to cotton dust. However, although these investigators were aware of the differences between byssinosis and other lung diseases such as tuberculosis, asthma, etc., they had no means at their disposal to distinguish completely between these various diseases. Therefore, complete confidence cannot be placed in their reports. A good description of this disease is included in the English Report of the Departmental Committee for 1932:[3]

> The continued effect of inhaling the dust is progressive. Consequently, its main effects may be considered in three stages, but there is no sharp division between these stages, as one gradually merges into the other as the malady progresses:
>
> (a) The stage of irritation — Irritation of the air passages causing cough and a tight feeling in the chest. This is usually of temporary duration, passing off in one or two days, but the susceptibility returns during a short absence from work, such as occurs at the weekend. It does not cause disablement and incapacity for work, and entirely disappears on removal from the dusty atmosphere.
>
> (b) The stage of temporary disablement or incapacity — After the operative has been exposed to the dust for some 10 or more years, the effects of the irritation become more persistent, and the operative suffers from early bronchitis or asthma, or both combined, associated with cough and mucous expectoration. This condition may cause temporary incapacity with intervals of absence from work, which are of short duration but increase in frequency, and lead in time to partial incapacity. At this stage it should be possible to determine by medical examination whether the operative should continue to be employed in a cardroom, since cessation from work in the dusty atmosphere is generally followed by recovery, or at any rate by marked improvement with capacity for work in another atmosphere.
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> (c) The stage of total disablement or incapacity — In this advanced stage there is chronic bronchitis, with emphysema. Cough is present with mucous or mucopurulent expectoration and shortness of breath on exertion. This condition is incurable and at this stage work in the dusty atmosphere becomes impossible, but improvement may take place and further progress of the disease be arrested or retarded by removal from the dusty environment of the cardroom. In the final stage of the malady the continued strain on the right side of the heart is apt to lead ultimately to cardiac failure.
>
> The rate at which these stages of ill-health develop varies in different individuals, as it depends on two factors: (a) the amount of the injurious constituent or constituents in the dust inhaled; and (b) the susceptibility of the individual. Owing to the diminution of the amount of dust, the frequency and severity of respiratory disease is now less in younger operatives, and the full effects of it probably take longer to develop than they did formerly. To pass through the various stages takes 10 to 20 years, or even longer.
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> i. Radiological examination of the patient's chest has not revealed any condition which may be described as specific, as, although some degree of fibrosis of the lung is found in certain cardroom operatives, this is indistinguishable from that which occurs in those of the general population suffering from bronchitis.
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> ii. Postmortem examination confirms the clinical findings already described but has not revealed any specific features which would enable the bronchitis of cardroom operatives to be distinguished from that which occurs in the general population. Hence all the evidence points to the conclusion that it is in the causation rather than in the character of the malady itself, that distinction may be made between the respiratory disease of cardroom operatives and that which occurs in the general population.

Incidence

Until recently, there was almost no information in the literature regarding the incidence of this disease in cotton workers. It was noted that the disease occurred in cotton workers, that cardroom and blowroom workers seemed to be affected more than other workers but no statistical data were presented. In a general way, it has been noted that the incidence is greater in England and Russia, and less (almost none) in the United States. Several reasons are suggested for this difference, such as the more rapid turnover of personnel in the United States mills, thereby not having workers exposed for a sufficient number of years; better ventilation in U. S. mills, etc.

Probably the first measurement of this disease and its effects was that furnished by the Registrar-General of England in his report for 1910-12, which was published in 1923. In this report, the death rates for strippers and grinders were recorded separately from other cotton workers and showed a definite excess from respiratory disease. About this time many mills began to take steps toward reducing the dust hazard, particularly in the cardroom. For example, the stripping brushes for cleaning the

teeth of carding engines were enclosed and exhausted, carding engines were vacuum cleaned, and the cardrooms were air conditioned. These steps proved to be effective in reducing the dustiness and as years passed, further steps were taken. Thus, it was believed that the bulk of the occupational hazard from cotton dust had been greatly reduced. In the early nineteen fifties, Schilling[4] noted that a recent study at that time showed that chronic chest disease overshadowed all other diseases in middleaged cotton workers employed in the dusty trades. Because of this, it was decided to find out if byssinosis was still a problem in the Lancashire cotton industry.

Because there are no specific clinical findings and no specific radiographic changes, the workers were classified by history as follows:

Normal: No symptoms of chest tightness or breathlessness on Mondays.

Byssinosis:

Grade I — Chest tightness and/or breathlessness on Mondays only.

Grade II — Chest tightness and/or breathlessness on Mondays and other days.

The investigators examined 190 male workers from the card and blowrooms and 88 controls. Of the 190 card and blowroom workers, 39% were normal, 35% were classified as grade I byssinosis and 25% were classified as grade II byssinosis. Of the 88 controls, all were classified as normal. When the data on the 190 card and blowroom workers were broken down as to job, it was found that the highest incidence was in the strippers and grinders, where 65% exhibited disease.

These investigators then graded the workers by clinical disability as follows:

Normal I — Able to keep up with normal men of own age on hills.

Slight II — Only able to keep up with normal men of own age on level.

Moderate III — Unable to do the above but can walk about a mile at own speed without stopping.

Severe IV — Only able to walk about 100 yards without stopping.

Severe V — Unable to do the above.

Four of the 190 workers were eliminated from this part of the study for various reasons. The remaining 186 were compared with the same 88 controls and it was found that 1) cotton workers had more of both temporary and permanent effort intolerance than the controls; 2) the strippers and grinders and blowroom workers had more than the other cotton workers.

In differentiating byssinosis from chronic bronchitis, the authors note:

"Men with chronic bronchitis develop tightness of the chest whenever they are exposed to a sufficient concentration of any dust.

"In the early stages of byssinosis, the worker is affected only by cotton dust and only on Mondays. Even in the later stages of the disease, Monday is the worst day, although the cardrooms are not dustier on that day. (Drummond, Hamlin, Donoghue, and Brownsett, 1954).

"The symptom complex of chronic bronchitis is therefore not the same as byssinosis."

As noted previously, there are no specific radiographic changes in byssinosis. To test this opinion, the authors selected 15 chest films from each of three groups of workers, normal cotton workers, cotton workers with grade II byssinosis, and normal controls. In studying these films with a radiologist, they were unable to distinguish one group from the next.

In 1960, Roach and Schilling[5] presented some specific data regarding the prevalence of this disease in three coarse and two fine cotton mills in the Lancashire area. They noted that in the coarse mills, 51% of the cardroom workers, 41% of the mixing and blowroom workers, and 2% of the spinningroom workers had byssinosis. In the fine mills, only 6% of the cardroom workers and none of the mixing and blowroom workers had byssinosis.

In addition, they noted a high degree of correlation between the prevalence of byssinosis and the dust concentrations. Finally, in correlating the prevalence with the various components of the dust, they found support for the view of a specific response to inhaled cotton dust and against the idea of mechanical irritation, with the evidence pointing to some constituent of the plant debris as the active agent.

Respiratory Function in Workers with Byssinosis

It has been noted that a characteristic feature of byssinosis is the development of what some have called "Monday fever." As a worker begins to develop byssinosis, he tends to experience a tightness of the chest and a breathlessness on Mondays or on the first day at work after an absence. These symptoms usually come on gradually and are worst during the afternoon or early in the evening. The early byssinotic usually feels quite well by the next morning and has no further trouble until the following Monday. As the worker becomes more severely affected, these symptoms tend to persist on Tuesdays also, then Wednesdays, and finally, they may be present throughout the week. As noted previously, if the disease continues to progress, permanent and severe disability may result.

This feature of byssinosis was noted by McKerrow *et al.*,[6] and they set up a study to examine more closely the short term effect of

cotton mill dust on respiratory function. The study was done in three parts. Specifically, the indirect maximum breathing capacity (MBC) and the airway resistance (AWR) were tested. In part I, these tests were performed on workers with grades I and II byssinosis, who were tested before starting work, and again four times during the day. In part II, some of the workers in part I were divided into two groups, half of whom continued at their regular jobs, the other half being transferred to a nondusty part of the plant. Workers without byssinosis were tested and no significant abnormalities were noted. Comparative studies were done in coal miners with negative results. In part III, they tested workers in another plant before and after installation of dust suppressing equipment, and demonstrated an improvement in ventilatory capacity.

The authors felt that these studies revealed that the ventilatory capacity of the lungs was related to the degree of byssinosis; that it was lower in byssinotics than in normal controls; and that in those with byssinosis, ventilatory capacity was lower on Mondays than on Thursdays. They conclude that there is a pharmacologically active constituent in the mill dust causing the ventilatory changes. Finally, preliminary studies using mepyramine suggested that the effect was not readily reversed by antihistaminic drugs.

Rayon Workers and Byssinosis

Because of lack of reported cases of byssinosis in rayon mills, it has been assumed that byssinosis does not occur in rayon workers. Since rayon is a cellulose fiber like cotton, flax, and hemp, it was felt that the finding of cases of byssinosis in the rayon mills might be significant in learning the etiology of byssinosis. A study was set up by Tiller[7] who interviewed rayon workers. Results showed that byssinosis does not occur in rayon mills — at least, not in the mill studied. Furthermore, cotton workers with byssinosis who had left the cotton mills and come to work in the rayon mill lost their chest tightness and other symptoms and felt much better.

Tiller and Schilling,[8] further to demonstrate the above results, performed ventilatory studies on the rayon workers, similar to those performed on cotton workers. These studies confirmed the clinical findings, indicating that the causative agent of byssinosis is absent in a rayon mill.

The Role and Mode of Action of Cotton Dust

From the time of the earliest recognition of this disease, the cause has been attributed to cotton dust. Although there may not have been much more than a simple association relating the dust and the disease at first, nevertheless, through the years, the evidence incriminating the dust has increased. The prime factor remains the association of the dust and the disease. This disease occurs wherever workers are exposed to great amounts of this dust. Studies have shown that the dustier the environment, the greater the incidence of the disease. In fact, it has been shown that the incidence of disease in one mill was inversely related to the distance from the carding machines to the worker. Where measures have been undertaken to decrease the dustiness, the incidence of disease has lessened. Finally, when a worker, even though he has byssinosis, is removed from a dusty job to a nondusty one, his condition improves rapidly.

Whereas the significance of the role of cotton dust is generally accepted, its mode of action is far from understood. Many different agents have been suggested by various investigators. Schilling[9] gives an interesting account:

> The causal agent for byssinosis was first suggested by Arlidge (1892), who blamed an inherent quality of the vegetable fibres; but these are made of cellulose, which in other forms — e.g. wood dust, and rayon — is not known to cause byssinosis. Collis (1909) blamed the emery dust produced by grinding the carding teeth. Middleton (1926) suggested mould fungi acting alone or with other constituents. The soluble proteins from leaf and seed coat have also been incriminated (Prausnitz, 1936).
>
> The high concentrations of bacteria in cardrooms of cotton mills and the high viable counts of bacteria and fungi in cotton waste have recently been considered as possible causes but not as agents of infection in the ordinary sense. (Furness and Maitland, 1952; Drummond and Hamlin, 1952). Moulds and bacteria have also been suggested as the cause of the disease in flax workers (Thiry, 1941).

Cotton dust might produce damage to the respiratory tract in still other ways; for example, as a mechanical irritant. However, cotton dust does not cause symptoms of irritation in all individuals exposed to it. Also, because of acclimatization, susceptible persons may not have symptoms on every exposure.

It is conceivable that the cotton dust may be harmful as a source of silica. However, the silica content of the dust is low. Also, dissimilarities between silicosis and cotton dust disease of the respiratory tract make silica an unlikely source of the disease.

Moulds and/or bacteria that act as pathogenic invaders or produce compounds toxic to the human organism may be the source of byssinosis. That these organisms act as pathogenic invaders is highly unlikely, in view of the evidence

that has accrued in contradiction of this idea. Caminita[10] states, "On the basis of this evidence, it does not appear likely that the ordinary symptoms among cotton workers are due to primary invasion by moulds or bacteria." However, he states further, "It may be concluded that there is a possibility that toxic products from microorganisms are regularly present in cotton dust, inhalation of which over a period of time might result in impaired health."

The idea of toxic products of microorganisms has received support by Pernis, Vigliani and Cavagna[11] in Italy, who in the Abstracts of the Thirteenth International Congress on Occupational Health, 1960, state:

> The pathologic manifestations observed in textile workers as a result of the inhalation of organic dust are manifold. Such diseases as byssinosis, mill fever, weaver's cough, hemp fever, and others have been described. The main symptoms are fever and/or dyspnea and cough, usually most marked on Mondays. Since cotton and other raw natural fibers are usually contaminated with varying amounts of gram-negative bacteria, we suggest that endotoxins of these bacteria play a role in the pathogenesis of these diseases, the prevalence on Mondays being easily accounted for by the well-known phenomenon of tolerance to endotoxins.
>
> Data will be presented to show the presence of endotoxins in extracts from raw cotton and other textile fibers and to show that inhalation of purified endotoxins can cause asthmatic attacks in experimental animals.

It has been suggested that the cotton dust might produce its effect by acting as a source of allergens. There are several factors against this etiology. As noted by Prausnitz, because of the extreme rarity of eye or skin changes, allergy is probably not the chief cause of the trouble. Further, the absence of eosinophilia in affected workers is evidence against the idea of allergy.

Some recent studies have been carried out by Cayton, *et al.*,[12] comparing cotton dust and house dust. They reported that "cotton dust extracts produced two types of skin reaction, an early reaction of wheal and flare and a late reaction of induration and erythema. These two reactions appeared to be caused by different substances. The late reaction was possibly a direct effect of some toxic component. The early reaction was of the type associated with allergy of the asthma-urticaria type. . . ." In comparing the cotton dust with house dust, whereas they appeared to contain similar components, the house dust did not give the late skin reaction. The authors concluded that 1) the two extracts were not identical, 2) the polysaccharide-polypeptide compounds were probably responsible for the early skin reaction, and 3) the source of the polysaccharide-polypeptide compounds is not known but could come from moulds or possibly bacteria.

Regarding bacteria in cotton mills, a study was carried out in 1952 by Drummond and Hamlin.[13] They found that the concentration of airborne bacteria in cardrooms of cotton mills was abnormally high. The counts were exceptionally high in the cardrooms and at precarding processes and were less so at the spinning and later processes. They noted that the counts varied with the origin of the cotton and the year of the crop. Hamlin then made a determination of the types of bacteria and found that the bulk of the organisms in the cardroom air belonged to those genera that are commonly associated with soil. No true anaerobes were isolated. The Genus Bacillus predominated. Others were Flavobacterium, Achromobacter, Aerobacter, Corynebacterium, Actinomyces, and Micrococcus. Organisms characteristically associated with the common respiratory tract diseases seldom were found.

Summary

The problem of byssinosis has been presented. The history of the disease, the clinical picture, and the epidemiology have been recounted. Although many studies and investigations have been carried out to establish the etiology of this disease, the etiology is still unknown.

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TENNIS LEG — A New Method of Treatment

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Tennis leg is a fairly common condition involving a tear in the muscle fibers of the gastrocnemius belly as a result of unusual plantar flexion of the foot. A sudden pain is experienced in the affected calf followed by limited disability for a variable period of time. Treatment in the past has been unsatisfactory and varied between the extremes of simple home remedies for "charleyhorse" to surgical exploration and suturing of the torn fibers. The purpose of this presentation is to discuss the condition and propose a new method of treatment.

Etiology

The clinical picture of tennis leg has been familiar for centuries and, as cited by Platt,[1] accurate descriptions can be found in the writings of Ambroise Pare, J. L. Petit (1721), and the Edinburgh anatomist and surgeon, Monro (1781), who, like John Hunter, was himself a victim of this accident. The exact anatomy involved was clouded for years by the thought that it represented a tear of the ribbon-like plantaris muscle lying between the gastrocnemius and soleus. Anatomists still refer occasionally to this muscle as the "old ladies' carriage muscle," alluding to the described syndrome that occurred frequently with sudden plantar flexion of the foot involved in ascending the high narrow step of a carriage. Platt[1] in 1931 presented 11 cases that were operated upon and in all the plantaris was intact. In fact, the plantaris muscle and tendon was used for reinforcement in the treatment of one case. In 1937, Conwell and Alldredge,[2] writing about the treatment of muscle tears, continued to incriminate the much maligned plantaris as the cause of tennis leg. This adamantine misconception remained until 1958 when Arner and Lindholm[3] again presented definitive evidence placing the guilt on the gastrocnemius where it rightly belonged. They surgically explored five cases showing the plantaris to be intact in all instances whereas the gastrocnemius contained a transverse rupture at the juncture between the medial belly and its tendon tissue, measuring between two and four cm. in length with a gap of from one to two cm. in all cases. In light of such evidence it would seem indisputable that tennis leg solely involves trauma of the gastrocnemius muscle.

Symptomatology

The diagnosis of tennis leg is quite simple and presents a typical symptom complex. Following a forced dorsiflexion of the foot the patient experiences a sudden sharp pain in the involved calf so unexpected that he usually turns about quickly expecting to see what has struck him. Such remarks as, "I thought I was bitten by a snake or a bee," "It felt like a stray bullet or a rock had hit me," or, if the patient is golfing, "I was sure someone had hit me with a golf ball," are classical. One gentlemen actually stated he heard a snap in his calf when the injury occurred. Often they will cry out suddenly, alarming their companions, or fall to the ground and grab the involved calf. When attempting to walk again there is pain whenever the heel is put down so that walking on the toe and holding the foot in an extended position becomes characteristic. The discomfort incident to a normal gait is such that if the patient is not limping, the diagnosis of tennis leg is in doubt.

Examination reveals generalized tenderness of the calf but exquisite tenderness to deep palpation with one finger at some spot in the belly of the gastrocnemius. There may be a slight depression of the skin over the point of maximum tenderness. Discoloration is common and edema of the foot may occur in a few hours. Ecchymoses are usually not seen initially, but 12 to 36 hours later, and then are likely to be lower in the leg around or just above the ankle. The patient generally hobbles about with gradually decreasing discomfort for a length of time ranging between two and four weeks. Women are apt to be more comfortable wearing high heeled shoes.

Method of Treatment

To our knowledge, there has been no specific treatment for tennis leg devised other than the somewhat radical approach of the surgeon which entails exploration and suturing of the torn fibers. Because of this we initially began injecting 1 to 2 cc of 2% procaine deep into the calf at the point of maximum tenderness with moderately successful results in relieving the discomfort. However, several repeated injections were necessary before the condition eventually resolved itself. Hoping for longer lasting relief a mixture of 1 cc of 2% procaine and 1 cc of Prednisolone Suspension 20 mg./cc* was injected deep into the area of greatest tenderness using a 19 gauge needle attached to a 5 cc syringe. The two substances were drawn from their respective vials with no specific attempt at mixing. Local anesthesia with procaine was used to facilitate a painless injection and the usual precaution of withdrawing the plunger to avoid injection into a vessel was, of course, exercised.

This method of treatment proved highly successful and has been used thus far in 12 cases of clinically typical tennis leg with quite dramatic cure in all. Relief begins in three or four hours and is complete in 24 to 48 hours. There has been no recurrence of the discomfort or necessity to repeat the initial injection. It is important that the injection be given deep into the calf, the depth of which varies with the individual musculature, but averaging one to three inches.

Comment

This condition is not uncommon. Grassheim[4] collected 500 cases of indirect muscle and tendon tears over a five year period and found the calf muscle was involved most frequently. Since being alerted to this injury we have collected 12 cases for treatment, even with a rather restricted practice. Undoubtedly the majority of cases are diagnosed by the patient as a severe "charleyhorse" or some similar condition and medical attention is not sought.

Paradoxically, none of the cases of tennis leg treated in this series occurred as a result of playing tennis. However, cases have been observed as a result of playing tennis, but were seen before this method of treatment was instituted and therefore are not included. The term is not a misnomer, as tennis could certainly be the most frequent specific sport accounting for the majority of such injuries. The movements involved in serving, particularly, entail a forced plantar flexion of the back foot with a forward motion, during which nearly the entire weight of the body is borne on this leg. One case occurred from stretching in an attempt to return a high lob during a badminton game. Three were the result of jumping over a ditch on the golf course and landing with the full weight of the body on the foot forced into flexion by the slope of the opposite bank. Similarly, one case was precipitated by running up an incline to the first tee. Nearly paralleling "the old ladies' carriage muscle," one episode occurred while stepping onto a high bus step while only the toes were on the step, and excessive flexion of the foot resulted. The remainder were variations of the same basic pattern of moderate to severe flexion of the foot preceded by a period during which the foot was kept in extension or the muscles were relaxed. In this respect women have the higher incidence as a consequence of using high heeled shoes. They usually give a history of being barefoot or using flat heels at the time of onset after becoming adapted to high heels. Two cases occurred upon getting out of an automobile following a long, tiring ride. Another case resulted when going to the bathroom after nine hours of sleep.

The small number of cases studied does not warrant a valid generalization with regard to the syndrome itself, however certain observations are interesting. The sex distribution was nearly equal (seven men and five women) and age apparently was not a factor, since the range was from 37 to 72 years. No specific body build or muscular development was predominant, and obesity did not seem to play a part. One might safely postulate, however, that the incidence will be higher in individuals not accustomed to physical exercise or effort involving dorsiflexion of the foot. With the advent of greater leisure time and the almost compulsive crusade for fresh air, sunshine, and inordinate physical exertion it is probable that physicians will see more and more tennis leg. It is hoped that a specific treatment such as presented here will prove useful.

Summary

The symptom complex involving a tear of the gastrocnemius muscle known as tennis leg has been discussed. Twelve cases were treated with deep local injection of a mixture containing 1 cc of 2% procaine and 1 cc of Prednisolone Suspension and excellent results were obtained in all instances.

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WHAT IS AGING?

Interest in aging is not a product of the twentieth century. From the beginning of recorded history, one finds references to certain aspects of "growing old." These references are difficult to correlate, since similar words and phrases are accorded different meanings.

Workers in this field more and more realize the need for the definition of some basic concepts. To do this, hasty generalization and emotional description must be laid aside. The effects resulting from the passage of time and the effects resulting from the impact of environment must be clearly delineated. These latter, being capable of modification, offer our greatest opportunity to improve the health of the race.

In a discussion of a glossary of terms, it seems logical that one starts with the concepts of the dictionary.

The dictionary is a book listing words of a language, with their meanings, in the same or another language, usually in alphabetical order, often with data regarding pronunciation, origin and usage. As an aside here it might be mentioned that Noah Webster published his *American Dictionary of the English Language* in 1828 at the age of 70. I mentioned the dictionary only to point out that it is not the final arbiter of the meaning of words. Quoting from the Introduction to *Webster's New International Dictionary*, Second Edition, one finds the following: "In the editorial striving for clearness, the general reader has been kept first in mind. But medical terms have been defined so that the definition can be understood by a lawyer or a merchant; legal terms so that they can be understood by layman who meets them in his general reading. At the same time, it must be realized that certain sciences have levels in which are used terms that cannot adequately be explained except to persons who have passed through preliminary stages of initiation."[1]

Dictionaries usually give a number of meanings for each word. The earliest meaning usually has some connection with the roots which go to make up the word. As the result of time and usage an original concept may be entirely lost in the atmosphere of modern implication and designation. One must not be concerned then if the glossary of terms defined by the Committee on Aging does not necessarily conform too well to the standard dictionaries.

Some of our discussions almost get stopped at times by the remark, "This is a matter of semantics." This remark, of course, is referring to semantics in linguistics as opposed to semantics as a branch of logic. The definition of the word "semantics" under these circumstances is usually accepted as follows: "A study of the connection between the linguistic feature and the mental process in the act of speaking."[2] Thus, if we were always sure of the other individual's mental process the problems of communication would be much simplified. As it stands, however, the linguistic features may be agreed upon universally, but the mental concept that each one formulates from these linguistic features may be quite varied. In fact, it might be so varied as to defeat the objectives of an entire program. Even though some of our discussions seem to hinge over matters of semantics, it is important that

we arrive at the same mental process so that there can be no differences when the total attitude of those interested is assayed. In fact, a doctrine and educational discipline developed by Count Alfred Korzybski was formulated in his book, *Science and Sanity*, in 1933 in which the term "semantics, general" was used to indicate concern with the many ways in which meanings of words and other symbols influenced the response of human beings to their environment and to each other.

At this stage, then, it seems that we can be guided by the dictionary, but not restricted by it in our concept of a glossary of terms. Also we should attempt to bring in all the coloring and variations in the meanings of the terms so that we may all arrive at the same mental process and concept that properly should be associated with the linguistic form.

Concepts of Aging

The dictionary tells us the phenomena of old age and aging includes the following meanings: "To become old, to grow old, to show marks of age, to undergo change with age or lapse of time, a diminution of essential qualities or forces as an incandescent light or transformer ages, to become mellow or ripe, or to acquire a desirable quality by standing undisturbed for some time as wine or varnish ages."

Thus it seems that "old age" and "aging" presented a great many variations in meaning before gerontology became a problem. Most of these concepts find good usage when applied to the failing lamp bulb or the mellow wine. They convey a total picture, the results of which are not due to time alone.

"To become old" and "to grow older" certainly are meaningless phrases and do not constitute true criteria of meaning in the various decades of even our own generation. The person described as old at the beginning of the century would probably now resent such a classification.

"To show the marks of age" is even more controversial, as there is less and less agreement on what constitutes the marks of aging. Since these so-called stigmata of aging have been subjected to scientific scrutiny, it is found that more often than not they are due to something other than the passage of time.

"A diminution of essential qualities or forces as an incandescent lamp or transformer ages" raises the question as to whether the author had in mind a lamp in "mothballs" or one in use. The difference in the diminution of essential qualities that would be produced by this variation in environment would certainly change the meaning of the phrase.

"To acquire a desirable quality by standing undisturbed for some time as wine ages" is to place emphasis on the factor that has been convenient for expression of a degree of elegance but which is probably least effective in obtaining the qualities desired. It seems that all would agree that the temperature and the light of the wine cellar, the regular turning of the bottles, and many other items of loving care must contribute something to the development of the desirable qualities in good wine.

"To undergo change with age or lapse of time" comes closer to stating a scientific truth. Many of the changes now attributed to the passage of time are due to factors that act in time, and not to time alone. We know practically nothing of these changes that might be wrought by time itself.[3]

Edward J. Stieglitz, in his book, *Geriatric Medicine*, called "aging" a part of living. "All living matter ages, and as it ages, it changes. Aging involves every one of the innumerable aspects of life. It begins with conception and ends only with death. Thus growth, development and maturation are just as much the consequences of the occult processes of aging as are the atrophic conditions and degeneration of senility. Evolution and involution are both affected by aging; pediatrics and geriatrics are closer than many realize. Gerontology is the science of aging in its broadest sense."[4]

This concept of aging is, indeed, a vague traditional estate representing a balance between evolution or growth and involution or atrophy. They go hand in hand, growth being an ascendency in the young and atrophy being an ascendency in the old. This is further elaborated on to include the involution or atrophy that occurs when certain structures like the thymus or ovaries cease to function. They get old. Thus, we become more mixed up trying to understand and account for varying degrees or rates of evolution or involution of certain parts of a whole that is itself of one age.

Would it not be simpler to use those proved tenets of physiology and anatomy which have taught that structure depends on function? Thus, the varying degree of evolution or involution in organs would represent a varying degree of need and function and would not be related to time or age. This at least, extricates us from the dilemma of having one part of the whole older or younger than the remainder.

Aging is the effect or change produced in the organism or the individual by time and time alone. Each stroke of man's own invention, the clock, must be associated with some meaningful change in the organism. To prove this seems to be a most difficult, if not impossible task. Even in the laboratory animal this problem is far

from simple. It is true that almost every factor in an animal's life can be fairly well regulated and stabilized. Changes that occur in time can be said to be associated with the passage of time. Some of these major changes, however, may be due to the fact that the animal is incarcerated in a cage, or that there may be some personality differences between him and his tender. In any case, removing all psychosomatic, physical, psychic, bacterial and viral causes for changes, we come up with the sum total of the effects caused by aging. If time produced no effects, then the removal of the foregoing causes should produce a situation where immortality would result. It is suggested by Carrel's growing a bit of heart of a chicken embryo that if all environmental factors producing change are controlled, the one-celled animal tends to be immortal. Carrel says, "When the composition of the medium is maintained, constant cellular colonies remain indefinitely in the same state of activity . . . if we care that its volume is increased by an adequate technique, they never olden. The colonies obtained from a heart fragment taken from a chicken embryo in 1912 continues growing today as actively as 23 years ago. In effect: they are immortal."[5]

Carrel further states, "It may be inferred that tissue cells in different conditions of activity 'in vivo' will soon multiply at the same rate when placed in similar media. This assumption was verified by cultivating fragments of connective tissue from chick embryos and adult chicken in nutrient media. At first the rate of growth of the embryonic tissue far exceeded that of the adult tissue; but after a few weeks, no difference was observed in the activity of both tissues . . . the connective tissue cells of an old animal are in a dormant condition. If cultivated in a nutrient media a long time elapses before they begin to proliferate."

Kullok, Kullok and Mayer conclude that differentiated cells which can produce themselves by division are immortal, if the medium in which they live is adequate. Or what is the same: death of any cell, undifferentiated or differentiated, is due to the effects of the inhabiting substances of the medium in which it lives. They further maintained that the facts experimentally known obliged one to discard the yet only partly accepted hypothesis that death of differentiated cells is due to the fact that they have a life cycle which has been determined beforehand.[6] Tundridge adds, "Alexis Carrel in his experimental work suggested that environmental factors were highly important if not the most important factors in senescence."[7,8]

The one-celled animal in the proper media may be said to possess immortality in that the involutionary process of aging is not evident, so long as all environmental factors are controlled. In the light of our concept the cell must age, that is, change in some way between the time of one cell division and the next. Although the proof may be impossible to obtain at the moment, there must be some difference between a daughter cell aged one second and a daughter cell aged 10 minutes just before the next division. This must be true, since in a controlled environment the division occurs as a function of time and a single cell of a certain species will have daughter cells only after the passage of so much time in a controlled environment. To measure this change in a unit of time is probably the purest estimation of the effects of time on protoplasm.

This type of immortality is almost entirely outside the realm of control or direction by the organism. Protection for the individual cell from its environment, including its own waste products, and the continuity of the race rests on the weak reed of environmental stability. Realizing these defects, evolution proceeds in the direction of exercising more and more control over these environmental factors. The age of specialization has begun.

Groups of cells were set aside to take care of irritability, growth, reproduction and temperature so as to regulate the environment of the complex individual or community of cells. Even this picture becomes more complicated when we realize that elemental substances making up the cells have their own spheres of homeostasis to maintain their balance in the entire universe of the total complex organism. Thus, potential but hazardous immortality of the individual cell was sacrificed for what seemed to be less immortality potential but a more certain definite life span. The proof that this was a wise choice lies in the fact that the most complex of all creatures has managed to become the dominant force of the universe, while the unstable, uncontrolled environment has kept the one-celled animal at that previous level.

In the light of fundamental concepts, we are now ready to define aging from a medical standpoint as the effect of time on protoplasm which prepares the individual cell in a proper environment for the next cell division.

All the present so-called stigmata of senescence and senility are the result of the impact of environment on the individual and can be altered by training, preparation, education and motivation.

A great deal of discussion centered around what name should be given to the group in which we are interested. Although the term "oldster" has been used rather frequently, I could not find this form at all in *Webster's New International*

Dictionary. The term "the aging" would probably apply to those who are becoming old or growing old or showing marks of age, according to the definition of aging already outlined. The term "aged" is defined as "That has grown old," which seems to indicate that the process is finished, when in reality we are talking about a group of people who are still continuing to live. "Age," "old," "elderly" come into comparison as referring to persons. "Old" applies to one who is far advanced in years, "A man old, wrinkled, faded, withered" (Shakespeare). "Aged" implies extreme old age; as the "aged creature came shuffling along with ivory-headed wand" (Keats). One is elderly who has passed the prime of life. None of these last three terms seem to be applicable to the group of people with which we are concerned. The terms "senior" or "senior citizen" both have something to recommend them. The term "senior" besides indicating advanced age, carries with it the connotation of being advanced in accomplishments, dignity, rank, and office as well. It should be the responsibility of the group we are interested in to possess these attributes and to be a source of knowledge, judgment and equanimity for the community. Adding the word "citizen" to the title emphasizes that the senior is still a member of a free community, and in return for his loyalty and allegiance is accorded protection of life, liberty, and property, as well as the right to vote and speak regarding the affairs of government.

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Privileged or Perilous

Privileged communication has always been considered one of the cornerstones of medical ethics yet testimony recently presented before the House Committee on Un-American Activities has raised a storm of controversy among doctors. A psychiatrist testified that one of the young men who defected to the Soviet Union a short while ago was basically an unreliable, emotionally disturbed individual and cited evidence from his professional contacts with this man to validate his disclosures. Many physicians immediately raised objections stating this doctor had breached a confidence and he was severely censured. Other doctors came stoutly to his defense raising the point of public weal pre-empting individual privilege. A similar matter was given legal standing when a court of law ruled that a doctor's statements to appropriate authorities concerning the unfitness of a man to hold a sensitive government position, was an act "justified by reason of his concept of duty to his government." The suit against the doctor for breach of confidence was dismissed.

The time has come seriously to evaluate the sanctity of the concept of privileged communication. In a world divided and constantly threatened by little minds bent on mischief, perhaps doctors have a greater obligation as citizens than as physicians. It is our contention that we are no longer isolated individuals and must needs recognize our obligation to protect society from disorganized, destructive and pernicious influences. Obviously the usual information concerning matters of a personal nature must always remain privileged but if a patient reveals to a doctor facts which could seriously jeopardize society's welfare, perhaps a doctor has a duty to place these revelations in the hands of the proper authorities. If a patient comes to us with tuberculosis, syphilis or smallpox, we do not hesitate to report this matter to the board of health even though this too, in a sense, is a breach of privilege. When a patient is a psychopathic personality with tendencies inimicable to the best interests of his society, is revelation a breach of privilege or suppression perilous?

—From *Westchester Medical Bulletin* **29:1, January, 1961, page 15.**

ACUTE UPPER RESPIRATORY DISORDERS

Symptomatic Management in Industrial Patients

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According to the United States Department of Health, upper respiratory disorders coupled with the Asian influenza accounted for 219 million lost work days between July, 1957, and June, 1958.[1] The common cold alone caused the loss of 150 million work days.[2] A large part of this absenteeism is inevitable, and probably desirable since in certain cases and at certain times, rest is needed. Much of it, however, is not necessary, but undoubtedly seems so to the patient whose profuse watery nasal discharge and congestion convince him that he is too uncomfortable to work.

The number of drugs available for symptomatic treatment almost rivals the incidence of the disorders, and while all provide some degree of relief, few control to any appreciable extent the profuse watery, nasal secretions and congestion commonly occurring with these disorders and with certain allergies. In an effort to make workers with these symptoms and under our care more comfortable, we treated a few with a new preparation (Ornade*) containing an agent to dry nasal secretions in its formula. Preliminary results with it were satisfactory, side effects of drowsiness were absent or slight, and so we extended our trial of the preparation among workers at our plant. This report summarizes our findings in 150 patients.

Plan of Study

Prompt relief and freedom from side effects are particularly important to the industrial physician so that the worker may promptly return to his duties, without having to be concerned with side effects that might jeopardize his safety by rendering him vulnerable to accident or injury. Therefore, in evaluating results, both speed and degree of symptomatic relief as well as lack of side effects were used as criteria.

The study group consisted of 88 men and 62 women, part of the 2500 employees of a chemical and paper manufacturing industry, who voluntarily requested treatment at the plant dispensary during a four month period. Both salaried and hourly workers were included. Their ages ranged from 18 to 65 years. All patients had symptoms of nasal congestion or profuse, watery, nasal secretions associated with upper respiratory tract infections or allergies. Ninety had coryza; 43, sinusitis, and 17 had hay fever.

Each patient was given six capsules and told to take one capsule every 12 hours, that is, one in the morning and one in the evening. The capsule contained an antisecretory agent, isopropamide (2.5 mg.), a decongestant, phenylpropanolamine (50 mg.), and an antihistamine, chlorprophenpyridamine (8 mg.). Patients who complained primarily of nighttime congestion were told to take the second capsule an hour or so before bedtime. We explained that we were interested in learning whether the drug relieved their symptoms, and if it did, how long it took to act.

Then we asked them to return to the dispensary in two days so we could evaluate their response and learn their comments. Those who failed to keep appointments were telephoned.

*Reg. T.M. Smith, Kline and French Laboratories, Philadelphia, Pa.

Results

Thirty patients (20%) reported marked symptomatic relief within one hour after ingestion of the first capsule, and 95 others (63%) within three hours. Eighteen patients (12%) experienced relief, but not until after the second capsule was taken or approximately 16 to 20 hours; seven (5%) obtained no relief after completing the prescribed course of therapy.

Most of the patients who obtained relief within one hour were those with coryza, and although this is a self-limiting condition, the prompt relief of excessive nasal secretion and decongestion of respiratory mucosa seemed more than coincidental. Patients with nighttime distress who took the drug an hour before bedtime often obtained sufficient relief and were able to get a good night's rest.

In sinusitis and hay fever, relief of symptoms was generally not apparent until three hours after the drug was taken, and continued therapy was required to reduce symptomatic distress. Several patients with sinusitis volunteered that the frequency and severity of their headaches had lessened. On the other hand, seven patients with chronic sinusitis failed to obtain any relief from the medication.

Workers were questioned to unearth side effects, and to some extent, the questioning itself may have influenced the results. Sleepiness was reported by 21 workers (14%); however, the degree of sleepiness was minor and did not constitute an accident hazard among those affected. In all instances, they were allowed to remain on the job. Four additional patients (2%) reported lightheadedness, but there was some doubt whether this was a side effect since it is a common symptom of sinusitis.

Summary

One hundred and fifty workers with symptoms of profuse, watery, nasal secretions or nasal congestion associated with coryza, sinusitis, or hay fever of moderate to severe degree were given an antisecretory agent combined with a decongestant and an antihistamine. Eighty-three percent obtained symptomatic relief in one to three hours. Slight drowsiness and lightheadedness occurred in 14% and 2%, respectively; however, all workers were able to perform satisfactorily and were comfortable enough to remain on the job.

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Death on the Farm

Fatal accidents among the farm population of the U.S. have decreased in the last decade, but still are responsible for about 11,700 deaths annually, it is reported by statisticians of the Metropolitan Life Insurance Company. This number, which includes fatal injuries suffered by farm residents both on and off the farm, is equivalent to a death rate of 55 per 100,000, compared with 52 for the whole population of the continental United States.

Motor vehicle accidents account for about 5,300 deaths or 45% of the total accident mortality among farm residents. Accidents arising out of and in the course of employment are responsible for an additional 29% of the deaths — twice the proportion in the population as a whole. Accidents in and about the farm house each year kill 2,700 persons, while public accidents other than motor vehicle take another 900 lives.

Among deaths resulting from farm work area mishaps, machinery accidents are the greatest killers, accounting for nearly 900 deaths. Reflecting the increasing mechanization of farm activities, the loss of life in machinery accidents rose from 28% of the total farm accident mortality in 1950 to 36% in 1958.

A firsthand report on group medical practice in a diversified industrial community in France.

Organization and Operation Of a Small Plant Industrial Medical Service In France

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The purpose of this discussion is to present our experience of nearly 10 years in an inter-enterprise medical service. This service does not provide any examples of original contributions, nor is it a prototype, because all the occupational medical services in France must conform to the norms established by the law of October 11, 1946. However, each doctor stamps his service with a particular orientation based on his personal views and the topographical and economic characteristics of the region he serves.

This medical service derives from the inter-professional medical services of the Haute-Ardeche, which covers about half of the enterprises in the province and employs three doctors for 9,000 workers. Its circle of activity centers around Annonay, the most important industrial center of Ardeche.

Before discussing the different corporations which constitute this service, it seems worthwhile to give a brief history of the industrial development of our city.

History

How can one explain the existence of an industrial center in such an unusual site as that occupied by Annonay: in the heart of the mountains, approximately 10 kilometers from the Rhone Valley, with which it communicates only by wild and picturesque routes, seemingly more suitable for tourism than for commerce? No doubt in order to compensate for the aridity and austerity of the spot, nature caused to spring from the granite of our mountains two rivers whose water had an incomparable value which the Romans knew how to exploit.

In the first centuries of our era, goats and sheep grazed abundantly on our "Piedmont." The Romans, trained in the art of curing leather by the Greeks, and finding the raw material on hand, in 403 A.D. established a tannery on the banks of one of the rivers which they had baptized "Dea Alma": the beneficent goddess. Through phonetic alteration, this river is today called "La Deume."

The discovery of paper and printing was almost fatal to this pastoral industry. However, at the beginning of the seventeenth century, Johannot established the first paper mill, which still stands on the banks of the Deume. His audacity was crowned with success. The papers produced here surpassed in fame the most beautiful papers from Holland; they were utilized, in particular, for the engravings and texts of the gallery of the Pitti Palace at Florence. After that, other paper factories were installed on the banks of the Deume: at Vidalon, Saint-Marcel, and Grosberty, which, with the Faya factory founded by Johannot, perpetuate in our days the fame of the papers of Annonay.

The fabrication of paper gave a new impetus to the leather industry: furriers, and leather tan-

ners and dressers were rivals for the waters of the Deume and the Cance, and came to swell the number of businesses on their banks. Other industries soon were established to utilize the by-products of the leather and paper industries: the washing of hair and wool for the fabrication of cloth and felt for paper factories and blanket mills; glue and gelatin factories, employing scraps from the tanneries and producing products used in the hat trade and in the fabrication of photographic plates; printing houses and envelope factories, depending directly on the paper manufacturing; foundries and metallurgical factories constructing machinery destined for the tanneries and bleaching plants.

The mulberry trees which formerly covered the hills in the vicinity led to the raising of silk worms and the installation of silk mills. Natural silk has now been supplanted by synthetic fibers, which supply most of the mills of the region.

Paper factories, bleaching plants, tanneries, metallurgical industries, weaving mills, and more recently, automobile and hosiery factories, have transformed this ancient center for the Roman legions — a vital crossroad between the river and the mountains — into an industrial center of 15,000 inhabitants, cupped at the bottom of its somber valleys and hemmed in by the steep slopes of its seven hills.

Composition of the Service

We are charged with the medical surveillance of 85 enterprises totaling 3,220 workers, divided as follows:

Enterprise	No. Employees	No. Companies
Textile	1,426	13
Paper	500	2
Building	318	16
Wool, felt	207	1
Metallurgy	169	4
Tanning, bleaching	50	4
Commerce	140	18
Miscellaneous	410	27

Among these 85 enterprises, we include: one large enterprise of more than 1,000 employees; four medium sized factories employing from 100 to 300 persons; and 80 small plants with one to 70 employees.

It is then, a heterogeneous service, a veritable mosaic of the principal industries situated in Annonay itself or in the neighborhood, on a perimeter of three to 14 kilometers. Therefore, if the polymorphism of our service presents some organizational difficulties, the actual service is easy. To provide this service, we have at our disposition:

1. A medical office established in the heart of the city and serving the urban workers, a total of approximately 1,900 persons. The medical records of our 3,220 employees are centralized and classified here. This central office is equipped with an x-ray machine.

2. Five medical offices established on the periphery, and serving approximately 1,100 employees from the medium sized industries. Only the most distant office (14 kilometers) has an x-ray machine.

3. A mobile unit serves the seven small factories on the outskirts (five to 10 kilometers) employing 200 workers; and permits us to take pulmonary x-rays of personnel of the medium sized firms not possessing an x-ray machine. We utilize this truck only occasionally; it is usually reserved for two other doctors whose services extend over half the department.

Organization

As with all other industrial physicians in France, our task involves the surveillance of the health of the workers and of the hygienic condition of the work areas; all therapy is forbidden except in case of emergency.

The medical surveillance is assured by visits on employment, periodic visits, visits at the time of return to work and visits for special medical surveillance.

For visits on employment and periodic visits, we complement our clinical examinations by a chest x-ray and a check for sugar and albumin in the urine.

In connection with the initial visit, we obtain a detailed family medical history, and for those under 18 years of age, the date of B.C.G. vaccination. At that time, we establish a systematic control through the application of new cutaneous tuberculin tests.

The clinical examination is like that by a practicing physician, including blood pressure, pulse, auscultation of the heart and lungs, abdominal examination, check for hernias, check of the reflexes of the pupils and tendons, and examination of the mouth and teeth.

Complementary examinations are required when indicated by the family history, the clinical examination, and the professional risks inherent in the future position; for example, examination of the sputum for arrested tubercular cases; Addis count for those for whom the three analyses of the urine (morning, noon, and evening) confirm the presence of albumin in the urine; and hemoglobin tests for former and future workers with benzol and lead.

Ordinarily, the person is called for his initial examination in the week preceding or following his entrance into the factory. He receives either a certificate of aptitude or a certificate of inaptitude, which is sent to his employer but about which he is informed orally.

On 354 examinations for employment per-

formed in 1958: three persons were found unfit: two for sequelae of accidents on the job which required a professional reclassification, one for pulmonary tuberculosis, discovered at that time; two unknown or unadmitted, epileptics were confirmed by electroencephalograms, following indications discovered at the examination; 35 ametropic adolescents, whose condition was unknown or insufficiently corrected for the work they would be doing, were referred to the ophthalmologist.

The periodic annual visit follows the same procedure, but presents a more complex organization problem. These visits must take place during working hours, or the time spent for the visit must be "remunerated for as if it were normal work time." The doctor must follow a strict rule of being exact and respecting the appointment hours, in order not to cause the factory the expense of wasted time.

We have divided our working time as follows:

1. One day a week (seven working hours) is devoted all year to the medical visits to the company with more than 1,000 employees.

2. One other day each week is reserved for visits to the medium sized companies possessing their own medical offices, with, for each of these, every two years, a session of chest x-rays using the medical truck.

This method provides a certain continuity to the medical visits at the important factories, and makes it easier for the employees situated at a distance from the city to have contact with the industrial physician, either to seek advice, or to follow up the recommendations given at the examination (treatment, consultation with a practicing physician or a specialist).

The problem is more difficult for the small companies, whose employees for the most part are called to the central office. It is necessary to arrange the hours of appointment in accordance with the distance of the factory and its nature.

Thus, one schedules the most distant factories for the end of the morning and evening, trying not to take more than two or three of their employees each half-day, and avoiding as much as possible scheduling late in the morning women who have charge of a meal or a family.

Coal deliverymen are seen in summer; construction workers in winter, during the time of bad weather; bank employees and merchants in the middle of the year, after the inventory period, excluding fair days and sales days.

On the other hand, it is necessary to make sure that the medical visit of some rural persons will coincide with the only days when they may be sure of transportation to the city: the eves of certain holidays such as Easter and the 14th of July.

We make sure that the notices of appointments are sent directly to the individuals concerned, two or three days before the date of their appointment, so that they may make any necessary preparations. It appears to us that absenteeism from the medical visit may often be explained by an underestimation of some minor details. If the task of the industrial physician is to adapt the man to the work and the work to the man, he must understand the demands placed on each person by the respective job.

In 1958, for a work force of 3,220 persons, outside of 354 visits at the time of employment and 82 visits for special surveillance requested by the individuals, 2,874 visits were made. These systematic medical visits led to the discovery of: 27 cases of hypertension, three with albumin; seven cases of pulmonary tuberculosis; seven cases of uterine myomas and ovarian cysts, five of which required surgery; five cardiac conditions, four of which were sequelae of Bouillaud's disease; three diabetics, one of which was pituitary; three cases of scoliosis in adolescents in the year following their entrance into the factory; one uterine neoplasm in a woman 40 years of age; one cancer of the larynx in a forewoman in a weaving mill; and 15 cases of albumin discovered in the three daily samples, three came from Bright's disease and two from renal bacteria.

We include in the visits for special surveillance: pregnant women engaged in heavy work — for these we check the blood pressure, weight, and urine each month after the fourth month of pregnancy; young people under 20 years of age who have shown an allergic tuberculin reaction within the year; and workers exposed to specific risks: in our service, benzol poisoning, lead poisoning, and silicosis, but only in a minor degree, for we include only nine painters using spray guns in the automobile plant, six printers, and 12 quarry workers.

Three months after the initial visit, a new blood test (including erythrocyte count, leucocyte count, platelet count, and bleeding and coagulation time) is required of spray painters, who thereafter are examined every three to six months.

It is the same for the printers, whose blood tests include a blood count and a search for basophilic red cells. Measurement of urea is done only in cases of albuminuria.

Our workers exposed to the risk of silicosis are quarrymen who work under the open sky with drills. For them, the medical visit always includes a chest x-ray. Up to now, the clinical examinations have never indicated any need for a chest exploratory examination.

The installation of well-ventilated painting

chambers in the auto plants, the increasing use of photographic printing, the drilling and mining in the open air, all help to explain why occupational illnesses are rare in our service. We do find some cases of occupational dermatosis due to cement, chrome, and synthetic fibers.

The rehiring of healed tuberculosis patients is sometimes facilitated by having them work half-time, with the Social Security service paying for the other half-day. Nevertheless, every such patient who returns to work must have an x-ray every three months for the first year, and will be subject to rigorous surveillance thereafter.

The hypertensives and the cardiacs request our services because of functional troubles or changes experienced in the performance of their work. It is often difficult to reconcile their physical possibilities with the demands of modern life. Certain postoperatives and accident cases require reclassification, which is arranged with the employer on the advice of the surgeon and psychologist.

Finally, mental illnesses require our particular attention: personality problems, social misfits, alcoholics, all those for whom it is essential to ease the inevitable frictions arising from contacts with their co-workers.

It is evident that these examinations, either because of their frequency or because of their nature, require more than the 20 or 30 minutes allocated for the ordinary medical visit. Those involved come voluntarily for appointments outside of working hours, and evidently are not recompensed for their time. These visits are interesting for us; they permit us to appreciate the repercussion of work on a state of health, and in a certain measure to evaluate the man's capacity for adaptation. In particular, they strengthen the bonds between doctor and patient and reveal to us the many stresses inflicted daily on the worker, stresses which have as much influence on his health as the work itself.

Our work as industrial physicians would be ineffective if we were ignorant of the work and the working conditions of the employees. For that reason, frequent visits to the factories are essential. This initiation into the techniques employed is often laborious and trying for the employer, the engineer or the foreman who is charged with familiarizing us with the jargon of each profession, reminding us of the elements of physics, chemistry, and mechanics, and explaining the function of the machine and the purpose of the worker's movements.

In most companies, the employer or the technical director gives us an outline of the work involved and the different types of positions, through a group tour of the factory. Afterwards, alone with the foreman and the worker, we study each position in detail.

This study requires many visits to the factory and is often completed through information about his work supplied to us by the person involved at the time of his medical examination.

After each visit to a factory, we make note of all that we have seen and learned. After the study of a position is completed, we submit our summary to the technician, so as to establish, in as precise and impartial manner as possible, a picture of the job that will parallel the picture of the individual's aptitude.

These visits often lead to an instructive exchange of views; they force the doctor to extend himself beyond the rather idealistic limits of pure medicine, and the technician to modify certain arbitrary opinions.

Comment

At the beginning of our service, we were afraid that the people would resist any intrusion into their professional life. Experience has proved this pessimism to be unjustified: absenteeism from the medical visit is the exception, and the expression of confidence in us manifested by the workers on many occasions has given us great encouragement.

Our task is facilitated through the comprehension of our colleagues: surgeons and doctors in the hospital who permit us to follow our hospitalized cases and to benefit from a post-university instruction; doctors in the country who help us to understand the psychology and mode of life of the rural worker; school medical inspectors, whose work often complements ours; and the doctors of the Social Security, with whom an exchange of views is indispensable for the future of our sick people.

These liaisons are most important for the industrial physician, as are the studies conducted by the social workers and the examinations by the psychologists. Without the firm collaboration of these different disciplines, industrial medicine could only vegetate.

In this way we have adapted industrial medicine to the human geography of our region. This organization is not definitive: it must change and harmonize with developments in medicine and in industry. It is with this in mind that our director, Professor Roche, has instituted at Lyon a weekly consultation for occupational diseases, involving presentation of cases arising from social problems; and created a center for treatment of acute poisonings.

Systematic Health Examinations in Industry

A Yugoslavian Experience

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The analysis of absences due to illness in industrial workers in Zagreb in the last few years reveals two main features:

(1) The proportion of individual groups of diseases producing working disability has remained more or less constant.

(2) The diseases of the respiratory system, the gastrointestinal system, the skin and subepithelial tissue, the organs of locomotion including diseases of the joints and muscles, neuropsychiatric diseases, and accidents comprise 75% of the total number of illnesses producing disability. Over 70% of the total number of days lost due to illness and accidents relate to the diseases belonging to these groups and to tuberculosis.

The data on which this analysis are based cannot fully serve for a morbidity appraisal, since they relate only to the diseases producing working disability, but to some extent they provide an idea of industrial pathology in Yugoslavia.

Advances both in hygiene and in the treatment of disease, improved socioeconomic and working conditions, changes in nutrition, a prolonged life expectancy, etc. have considerably altered the morbidity pattern in industry as well as in any other population segment. Acute microbial infections are no longer such a serious problem. Besides injuries and a certain number of occupational diseases and diseases indirectly connected with occupation, an ever growing number of chronic, degenerative diseases connected with changes in organic systems but etiologically unexplained in most cases, have become a pronounced feature of the present-day morbidity picture. In Yugoslavia, some "classical" diseases eradicated or reduced to a minimum in other areas are still to be considered, but a detailed analysis of the diseases encountered indicates that also in this country the same morbidity changes have gradually been taking place both in industry and other population groups.

In the control of such diseases an early diagnosis and detection of incipient pathologic changes are of paramount importance. It has therefore become urgent that, besides the control of accidents and illnesses more or less connected with occupation, the development of advanced types of preventive medical work on the control and early treatment of various "general" diseases, especially those which are either frequent or significant for working disability, should be given special emphasis. In this respect systematic health examinations, i.e. a regular follow-up of workers' health, occupies a special place. The effectiveness of such examinations has been amply discussed in the literature.[1,2,3,4,5,6,7,8,9]

The opportunity for early diagnosis and treatment of pathologic conditions is not the only advantage of systematic examination. Its great value is also in providing a thorough insight into the morbidity of a working collective, and into socioeconomic and others factors relevant to its health, which is a prerequisite for any correct planning, conducting, and evaluation of systematic health activity. However, in view of many difficulties in the collection of data, their analysis and assessment, the establishment of accurate diagnosis, the distinction between health and illness, between major and minor conditions, the methods applied in the carrying out of systematic health examination undoubtedly play an extremely important role. On the one hand, these methods should fulfill minimum medical

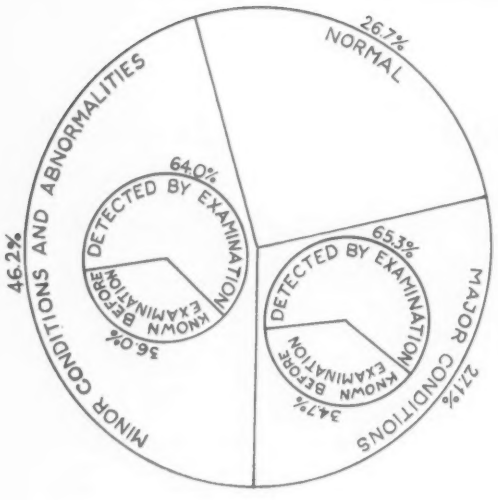

Figure 1

requirements, i.e. they should secure a significant percentage of accurate diagnoses in as early a stage of disease as possible. On the other hand, regarding the techniques used, they should be practical, economically justifiable, and involving a reasonable amount of time of both the medical staff and the workers.

In order to gain experience in the effectiveness of systematic health examination, especially with regard to the methods used, we have introduced these examinations in a Zagreb factory.

Methods

The factory selected for this study manufactures plastic and metal utensils. There is nothing unique about this factory as to the composition of workers (sex, age, qualifications) compared with other factories in Yugoslavia. There is also nothing unusual in this factory concerning production techniques or working environment. Occupational hazards do not represent any special concern.

At the beginning of our study, the total number of persons employed was 636. There were 534 workers (339 men and 195 women), and 102 other employees (65 men and 37 women).

The examination was organized on a voluntary basis. A special room was adapted for this purpose. Some examinations were performed in health institutions outside the factory.

The examination included history, physical examination, blood counts, erythrocyte sedimentation rate, urine analysis, as well as systematic serologic tests for syphilis, mass radiography, and gynecological examination with colposcopy and local cytologic analysis. If necessary, additional diagnostic tests, specialist consultations, and hospital examination were employed. The examination was deliberately planned on a larger scale in order to provide sufficient data for morbidity analysis and for the evaluation of the tests to be selected as necessary.

Results

564 persons underwent examination: 491 workers (305 men and 186 women) and 73 salaried personnel (46 men and 27 women).

TABLE I.

No.	Diagnosis (Groups of diseases)	Number male	female	Total	Percentage of the total number of the persons examined	Notes
1	Tuberculosis (I)	14	4	18	3.2	
2	Venereal diseases (II)	—	9	9	1.6	Syphilis
3	Infectious and parasitic diseases (III)	18	8	26	4.6	
4	Tumors (IV)	—	2	2	0.3	
5	Allergic diseases (V)	2	2	4	0.7	
6	Diseases of endocrine glands (VI)	18	22	40	7.0	90% relates to goiter
7	Metabolic diseases and avitaminoses (VII)	14	11	25	4.4	Mainly sequelae of rickets; obesity
8	Diseases of blood and blood-forming organs (VIII)	—	27	27	4.8	
9	Neurologic and psychiatric diseases (IX)	9	1	10	1.7	
10	Diseases of sense organs (X)	29	23	52	9.2	42% relates to eye refraction anomalies
11	Heart and blood vessels diseases (XII & XIII)	55	51	106	18.7	58% relates to varicosis and hemorrhoids
12	Diseases of the respiratory system (XIV)	60	33	93	16.5	52% relates to chronic inflammations and hypertrophy in the nose and throat
13	Diseases of the mouth and teeth (without caries) (XV)	2	4	6	1.1	
14	Diseases of the gastro-intestinal tract (XVI)	31	15	46	8.1	
15	Genitourinary diseases (XVII)	3	8	11	1.9	
16	Diseases of female genital organs (XVIII)	—	124	124	22.0	
17	Diseases of the skin and subepithelial tissue (XX)	10	9	19	3.3	
18	Diseases of the organs of locomotion, the bones, joints and muscles (XXI)	41	40	81	14.3	72% relates to foot deformities
19	Symptoms, insufficiently defined conditions and senility (XXIV)	13	10	23	4.1	Mainly vegetative dystonia
	Total number of diagnoses made	319	403	722		

According to results, the persons examined were divided into three groups: (1) without symptoms of any kind, (2) with minor, reversible conditions; with chronic conditions and anomalies with no tendency to progression and no effect on working ability, and (3) with complex chronic, degenerative changes likely to produce working disability; with acute and subacute processes tending to recur and produce trouble of longer duration (Figure 1).

Diseases known before examination were classified separately from those detected by examination.

Table I shows all the pathologic conditions recorded. They are listed according to the Yugoslav Statistical Classification of Disease, Injury, and Causes of Death, worked out on the basis of the International Classification of 1948.

More serious conditions detected by examination are indicated in Figure 2.

Among minor conditions detected by examination there were a great number of the diseases of female genital organs (68.5%), refraction eye abnormalities (78%), gastric catarrh (65%), feet deformities (59%), mild forms of arthrosis and spondilarthrosis (70%), and intestinal parasitosis.

Figure 3 shows the contribution of individual diagnostic methods (in %) in the diagnosis of comparatively major conditions.

Minor conditions and abnormalities detected by examination were diagnosed by history and physical examination in 90% of the cases.

Comment

The morbidity evidence obtained by systematic health examination in the selected factory is characterized by a high percentage of the diseases of female genital organs, nonrheumatic cardiovascular diseases, diseases of the respiratory system, diseases of the joints and muscles, and diseases of sense organs, the liver, and endocrine glands. The diseases of the skin, the blood, infections and parasitic diseases, metabolic diseases, avitaminoses, and tuberculosis have

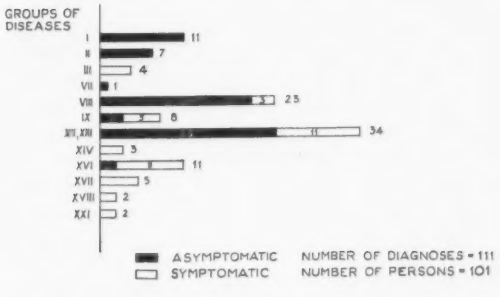

Figure 2

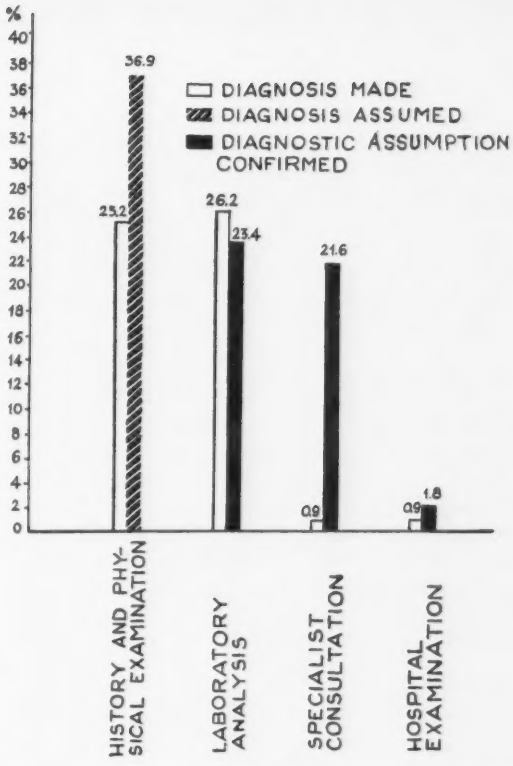

Figure 3

also proved frequent. There is also a comparatively high percentage of venereal diseases, especially in view of the fact that syphilis was diagnosed in all the cases recorded (9).

From these data it may be seen that the morbidity pattern as revealed by systematic health examination in this factory is considerably different from statistical records on diseases responsible for working disability in productive population of Zagreb. This also relates to data on diseases found to be responsible for working disability in the same factory a few years prior to the examination discussed in this paper. All this shows once again that a real picture of the morbidity of a certain population may be obtained only by a systematic medical follow-up of all the members of this population group, since a great many diseases develop asymptomatically or with symptoms not serious enough to persuade the patient to seek the doctor's help.

It is interesting to compare the results obtained by systematic examination in this Zagreb factory with those obtained in some other countries. In Norway, according to the records from 1948 and 1949,[8] the most frequent conditions were rheumatic diseases, the diseases of the bones, the diseases of the heart and blood vessels, and the diseases of the respiratory system, di-

gestion, the skin, the ear, and the nervous system. According to data collected by American authors on the results of pre-employment and periodic health examination,[1,2,3,4,5,6,7] a dominant place is occupied by cardiovascular diseases, obesity, gastrointestinal troubles, metabolic, and neuropsychiatric diseases. Franco[1] also found a comparatively high percentage of tumors (mostly benign in character). Recording his early observations on systematic health examination in an Italian factory, Levi[9] mentioned anemia, chronic inflammation of the respiratory system, goiter, and hypertonia.

As it may be seen from these few instances, the morbidity pattern varies from country to country, which to a great extent may be ascribed to a different approach and different criteria in assessing the results obtained. Some results relate to male collectives only,[1,2] or exclusively to administrative personnel,[4,5] or are based on laboratory tests applied on a different scale. Yet, there is something in common in all these results: cardiovascular disorders, chronic diseases of the digestive and respiratory systems, as well as other chronic, degenerative diseases occur everywhere frequently.

In this country, besides the diseases noted, tuberculosis is still to be considered, though in more advanced countries it is definitely on the decrease.

As to the major conditions in this factory, there is a statistically significant higher morbidity in women ($\chi^2 = 19.76$; $P < 1\%$). Among the diseases recorded, anemia, syphilis, and genitourinary diseases, as well as goiter among minor conditions, are also far more frequent in women. The incidence of major diseases increases with age. Cardiovascular diseases in particular are considerably more frequent in persons advanced in years.

As has already been mentioned, a considerable number of previously unrecognized conditions were detected by these systematic health examinations in this Zagreb factory. The same was also observed by other authors. Franco[1] writes that out of the total number of major conditions under his control, 75% first were detected by systematic examination. Out of 34,561 pathologic conditions recorded during systematic health examination in Norway in 1948 and 1949, 11,639 had not been treated previously, which indicated that prior to the examination these pathologic conditions had not been known.

The importance of history and physical examination in the detection of disease by systematic examination, though already pointed out, should be done so once again, since in practice one is often apt to neglect these diagnostic tools on the false assumption that specialist examination and complicated laboratory tests are essential to the establishment of an accurate diagnosis.

The family history as part of the history has proved less rewarding, though the presence of some diseases in the family may give a hint to the doctor of their recurrence in the individual examined. Hereditary, constitutional, and epidemiological relationships were sometimes beyond dispute. There was also a comparatively high percentage of tuberculosis in persons from tuberculous families (6).

In this study, work history has not proved useful since in the factory observed there are no specific occupational hazards.

However, that part of the history relating to socioeconomic conditions was extremely instructive, though an evaluation regarding the relationship between these factors and the occurrence of disease is not easy. A statistically higher morbidity rate in women speaks for an association between living conditions and morbidity. The majority of the women are unskilled workers with low income. Besides their work in the factory, women are for the most part in charge of regular household work. The family affairs of a good many women are unsettled (divorced, widows with children etc.). There are also some direct observations indicating the influence of living conditions on morbidity. For instance, of 18 tuberculous persons, seven complained of bad housing. In the factory observed syphilis is a disease of unskilled women (both single and divorced), except in one case.

Proctoscopy was not included in the examination on psychological grounds. We expected reluctance. But the fact was also that there were only five persons with pronounced large intestine troubles. In three of them amoebic dysentery was diagnosed, while in two cases the etiology of colitis remained unexplained in spite of detailed examination.

The Snellen's test, as part of the examination, has proved useful for selecting cases to be sent to the specialist for a more detailed eye analysis and vision correction.

In trying to assess the results of erythrocyte and hemoglobin values, we faced the problem of what to consider a pathologic finding. The values recorded by foreign authors are usually higher than those recorded in this country. Moreover, the results of Yugoslav authors vary unduly, since they relate to different population groups and the methods used for the determination of hemoglobin are different. The values obtained by the assessment of normal erythrocyte and hemoglobin values in the factory selected are shown in Table II.

The persons with the clinical finding likely to influence the erythrocyte and hemoglobin values

TABLE II.

Sex	Number	Erythrocytes (10^3 in mm^3) $\bar{x}$	s	$s_{\bar{x}}$	Hemoglobin (Sahli) g% $\bar{x}$	s	$s_{\bar{x}}$
Men	348	4.57	0.25	0.01	14.19	0.95	0.05
Women	175	4.11	0.46	0.04	12.36	0.90	0.07

were excluded from the assessment. Regardless of the difficult interpretation of results, the determination of the number of erythrocytes and of hemoglobin content proved a useful diagnostic test. If analyzing the values taken as pronounced anemia (E < 4.000,000 men, < 3.500,000 women, Hb < 11.2 g%), only in one case of sideropenic anemia and three cases of normocytic anemia did there exist some objective signs or more pronounced subjective complaints. In these cases the physical examination itself (with the history) already suggested the diagnosis. All other cases were established by laboratory tests only.

In the majority of cases leucocyte values were normal (between 4-10,000/mm^3). Leucocytosis was found in four cases. In all of them the presence of an acute infection was evidenced by physical examination. By the leucocyte count leukopenia was established in two cases, one of which seemed to be connected with thyreostatic treatment, and the other remained clinically unexplained.

The analysis of these results makes the use of the leucocyte count as a routine test questionable. Admittedly, the case of leukopenia could not have been detected without the leucocyte count. In the case of metylthiouracil treatment, leukopenia was to be expected, and the leucocyte check was necessary.

The same applies to the cases of acute infection regarding leucocytosis. That means that out of all pathologic findings one single result was not suggested by the history and physical examination. This speaks against the leucocyte count as a systematic diagnostic means to be used regardless of the results of physical examination.

The same may be said for the differential blood count. The finding of microcytes and target cells in one case led to a detailed clinical examination which revealed Mediterranean anemia (type minor). However, the discrepancy between the erythrocyte and hemoglobin value in this case had already indicated the need of a closer examination.

Differential blood count changes are usually reflected in clinical findings. Deviations are rare. Here again the question arises whether this analysis is to be used routinely, or should it be used only as an occasional test when indicated by physical examination.

The determination of the erythrocyte sedimentation rate proved valuable. In one case of active lung tuberculosis and an incipient cardiac infarct respectively, the increased erythrocyte sedimentation rate was the only objective finding suggesting a serious condition. In these persons only radiography and electrocardiography made the diagnosis possible. In seven cases the reason of the increased erythrocyte sedimentation rate remained unexplained, but on repeated examination three of these cases normalized.

Urine analysis: In the urine analysis, emphasis lay on the protein analysis. In one case only the sediment indicated a serious finding (a mass of erythrocytes), while albumin was negative. In all other pathologic sediment findings, albumin was present in the urine. In the majority of cases with pathological urine findings there existed pronounced genitourinary troubles. The analysis of the sediment seems therefore unnecessary unless albumin is found in the urine, or unless clinically required by subjective complaints. It has also been shown that analysis should be repeated several times (five cases of normalized findings in repeated analysis).

Serologic tests for syphilis: Out of seven detected cases of syphilis, six were diagnosed by serological tests only: two of them aged 29, two between 30-34, and two over 45. They all denied the existence of any luetic infection.

According to statistical data on diseases producing working disability in socially insured persons in the territory of Zagreb, the incidence of syphilis is recorded to be no more than .1%. However, there is not much reliability in these data, since in their collection sero-reactions have not been used routinely in nonhospital health services, whereas by history and physical examination it is impossible to detect more than a low percentage of syphilitic infections. This has also been proved in our investigations which uncovered a comparatively high percentage of newly detected latent seropositive luetic infections.

Mass radiography: The cases of lung tuberculosis were detected only by mass radiography or by further analysis suggested by mass radiography. Admittedly, in some cases there were symptoms already evidenced by history and physical examination, but their relation with lung tuberculosis was determined only later.

Of 36 mass radiography findings suspicious of tuberculosis, in 25 cases this doubt was rejected by additional analysis. Mass radiography cannot give a definite diagnosis of tuberculosis, but only an indication of the cases suspected. For a final diagnosis additional examinations are necessary (x-rays, tomography, sputum analysis for Koch's bacillus). Mass radiography cannot be

replaced by history, or physical examination, or lung diascopy itself if carried out by an inadequately trained doctor.

Of other diagnostic laboratory tests used in addition to routine tests, liver function tests (17), various x-rays (24), and gastric juice determination (22) were employed most frequently. They proved necessary mainly in the cases suspected of liver and digestive system disorders.

In connection with the use of electrocardiography as a means for the diagnosis of cardiovascular diseases, coronary diseases are of greatest interest. In spite of its limitations as a diagnostic tool, electrocardiography has proved valuable in the cases of latent coronary diseases. Six cases with symptoms of coronary insufficiency of a chronic type have been evidenced by this method.

The analysis of pathologic electrocardiographic findings showed a higher incidence in older age groups (over 50). Out of a total of 38 electrocardiograms of the persons over 50, 19 were more or less pathologic, whereas in the younger groups under 50, out of 39 electrocardiograms only eight were pathologic. However, regardless of age, most pathologic electrocardiograms were found in those who complained of heart trouble or showed a pathological finding by physical examination (most frequently arteriosclerotic hypertension).

A stool analysis for amoebas has also proved useful, especially in the cases of large intestine troubles, no matter how slight they may be. Out of 23 such cases, endamoeba histolytica appeared in four.

Systematic gynecologic examination: According to data on diseases causing working disability in the working group of the insured inhabitants of Zagreb, the diseases of female genital organs amount approximately to 3%. The results of systematic examination in the selected factory indicate that the incidence of these diseases is actually higher (Table I). The conditions under which women work in industry, mostly as unskilled workers, are undoubtedly related to the occurrence of these diseases. Admittedly, in the factory selected there is no statistically significant difference in the incidence of the diseases of genital organs between women workers and women clerks. In any case, a generally low standard of health education and hygiene habits plays an important part.

The participation of specialists in the number of the diagnoses made or confirmed was as follows: the otolaryngologist 28, the orthopedist 15, the phthisiologist 11, the opththalmologist seven, the internist-cardiologist six, the neuropsychiatrist five, and the dermatologist two.

Admission to hospital for diagnostic purposes was necessary in eight cases (seven patients were sent to the Internal Medicine Department, and one patient to the Surgery Department). In one case only was the final diagnosis made on admission to hospital (Mediterranean anemia), in five cases admission to the hospital confirmed the diagnosis made previously, and in two cases the nature of the disease remained obscure even on admission to hospital.

Summary

This paper presents the results of 564 physical examinations of workers employed in a Yugoslavian industry engaged in the manufacture of plastic and metal utensils. One of the purposes of this publication is to permit comparison with similar physical examinations carried out in other countries.

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The Present Status And the Future Of Workmen's Compensation Laws

The Viewpoint of Management

Continually workmen's compensation laws are undergoing changes. By and large these changes reflect liberalization of the provisions favorable to the injured workman. Notwithstanding, all these laws are being subjected to attack from many quarters by charges that workmen's compensation laws have not kept step with social progress. One complaint is that industrial commissions are disposed to offer resistance to the transformation of workmen's compensation laws into a form of social insurance. One well meaning physician is credited with the statement that awards from workmen's compensation funds should be more related to the needs of the claimant than to the merits of the claim and that in every instance of a claim before an industrial commission some means should be found to make an award to the workman in the event that there be no other source of funds in the presence of need. Any such attitude represents a marked departure from the original concept of workmen's compensation for injury in occupational diseases. It is understandable that the Chamber of Commerce of the United States will have views on this subject of workmen's compensation. Since for many years the writer was an officer and director of the National Chamber the views here presented may be regarded as reflecting the attitude of the National Chamber. It is equally understandable that the writer, as president of an insurance company that provides coverage for a substantial number of workmen's compensation risks, in speaking for his company and for himself as a person, is not lacking interest in the present status and the future of workmen's compensation laws.

Parts of this article are based on an address given at a meeting of the International Association of Industrial Accident Boards and Commissions held at Seattle, Wash.

The state administration of workmen's compensation has been charged with failure. It has been said that the record is a sorry one. It has been stated that America should hang its head in shame for the shabby way which industrial society has treated the man injured on the job. It is claimed that the worker has not been provided with adequate medical care and rehabilitation; that the benefit levels are inadequate; that state safety laws are an abysmal failure; that employers oppose every improvement to be made in the system; and that insurance companies motivated by greed and avarice do all they can to deny the worker his just due. It is further claimed that state legislators and administrators are so influenced by politics that nothing can be done to improve the operation of the system. As a solution to these deficiencies, these critics propose the abolishment of state administration of workmen's compensation and the establishment of a federal system.

Certainly, I believe in frank criticism and honest self-appraisal. This is necessary if we are to improve. But that does not mean that we ignore the progress we have made. Faults must be balanced with accomplishment. Those who have been so critical of our workmen's compensation system have developed a perfect 20-20 vision when it comes to finding fault, but they seemingly have developed a severe case of myopia in seeing its good points. They apparently see only what they want to see. And from this nearsighted viewpoint, they offer as a solution the establishment of a workmen's compensation system on a federal basis. Are they justified in their criticisms of state administration of workmen's compensation laws? Let us look at the record:

Notwithstanding frequent statements to the contrary there have been substantial improve-

ments in the workmen's compensation laws since their original enactment, and in particular during the past 20 years. As recently as 1940, only 12 jurisdictions provided unlimited medical benefits; the average duration was 63 days and the average maximum amount was $258.12. Today 35 states provide substantially unlimited medical care, and among the remaining jurisdictions the average duration is 276.2 days while the average maximum amount payable is $2,168.75.

In 1938 the national average maximum weekly benefit rate was said to be $18.74. Today it is $43.09. Thus, in the past 21 years the average rate has increased $24.35, to more than double what it was then.

Promptness of payment is, of course, a very important phase of workmen's compensation. The sources in which these accomplishments can be measured are limited. I would, however, refer you to the reports of New York, Wisconsin, and other state administrative agencies which show the improvements that have been made in this important field. Furthermore, Herman M. and Anne R. Somers, in their book entitled *Workmen's Compensation*, state that there has been considerable improvement in reducing the average time lapse between the date of disability and the first payment of compensation.

Rehabilitation, too, is a very important phase of workmen's compensation. Again, the annual proceedings of this association serve to illustrate the advancements which have been made. For example, in the 1956 report of the Rehabilitation Committee of the International Association of Industrial Accident Boards and Commissions it is said:

> The use of rehabilitation centers for the treatment of injured workers and the use of other rehabilitation facilities have made a good start in the United States. Actually, if we realize that the program for the most part is less than 10 years old, excellent progress has been made.

In the safety features of workmen's compensation we can be most proud, yet this is an area in which the critics of the system have been most active. Based upon data published by the National Safety Council, both the frequency and severity of workmen's compensation accidents for the year ending December 31, 1957, are reported to be 52% below the 1935-39 average. These ratios fluctuated somewhat during the war years, but since then there have been consistent reductions. Administrators, labor, management, and the insurance industry can point with pride to this accomplishment.

These are but a few of the many improvements which have taken place. I point them out simply to illustrate that those of us who have been closely associated with the system need not be ashamed of its accomplishments to date.

In spite of past accomplishments, there is room for improvement. The existence of deficiencies in the system, however, does not mean that the adoption of a federal system would ipso facto have solved them or even made an improvement in the methods whereby injured workmen are compensated and rehabilitated. Has the experience of the federal government in other fields been such to justify the confidence of those who advocate a federal system? I think not. There is nothing magic about the federal government. It is run by people as are the states. It, too, has problems, only they are bigger, more complex and less likely to be solved.

In the numerous drives for centralization of government power, stress has been placed upon the benefits believed to flow from a federal system. The roundabout route by which benefits are derived from the revenue source, that is, from the general public via employer costs, tends to obscure the true cost from those who must ultimately bear its burden. Where the collection of revenue and the payment of benefits are made at the state level both beneficiaries and those who provide the revenue know the true costs and can best judge the quality of administration.

There are certain fundamental principles which are basic to the proper functioning of the workmen's compensation system if it is to meet the social and economic conditions that society may impose upon it. The demands made upon the system will vary from state to state due to the difference in industrial, social and economic characteristics. In that the system is an integral part of the social and economic structure, it must be responsive and sufficiently elastic to meet the needs of the individual community and state. The system, if functioning properly, must naturally evolve to meet changing conditions. The bigger the system and the more uniform, the less incentive there is to improve and the less sensitive it is to the needs of local conditions. Uniformity in the case of workmen's compensation would not really aid, but would only hinder progress.

What may be sound policy for one state may not be sound for another. It is as unfair to establish a standard of benefits based upon a high wage industrial community for application to a low wage nonindustrial locality as to apply low benefits to a high wage industrial area. Both the worker and the employer find greater freedom of expression in a state forum than could possibly be found in the already overburdened and cumbersome legislative processes of Congress. The history of industrial progress shows

the greatest strides are made in a free and unregimented framework. Such progress and development cannot be marked off for the sake of uniformity and centralization.

In the last analysis, the decision of whether a system is adequate or inadequate should rest with the people of the state involved, for they are the ones who are primarily concerned. The law should reflect the desires of the people of that state. Contrary to what the critics say, workmen's compensation laws have received the attention of the people that have a vital interest in seeing that they function properly. Employer groups, labor unions, insurance companies, professional groups, and others have participated in the free exchange of ideas in the state legislative forums which have worked for the improvement of these laws.

To deny the legislative process of the states is to deny the propriety of the very basis of our constitutional system which recognizes the sovereignty of the constituent states and the capacity of the states to govern. The problem, then, is broader than the question of workmen's compensation. It goes to the very fundamental of whether centralized government or local government can best serve the needs of the people. It is the position of the National Chamber of Commerce that workmen's compensation should be provided for by the laws of the several states and that federal workmen's compensation legislation should be limited to employment exclusively under federal jurisdiction.

Future Needs

While I have enumerated the achievements of the state compensation system, the record does not invite complacency. A glimpse into the new age of atoms and space reveals an infinite number of new fields of industrial development. Developments on the drawing boards and in the minds of our scientists will become realities of tomorrow. If we enjoy the wonders of this new age we must accept its hazards and face its challenges. The system must be as dynamic as the industry it serves and the economy in which it lives. It must be capable of meeting the needs of the labor force for which it was created and adjusted to the capacity of the industry which supports it.

It is the responsibility of both management and labor to review state workmen's compensation laws and their administration to see that they meet these needs. It is the responsibility of insurance companies, professional groups and others who are integral parts of the administrative process of workmen's compensation to reevaluate their position and strive for further and continued improvement.

One word about the role insurance companies play in this picture: It has been charged that insurance companies are hostile to the working man. This is not so. The role of insurance is one of service to both employer and employee. It has been the policy of the insurance industry not to take sides on adequacy of benefits issue. It is our function to provide labor and management and the legislatures with our technical knowledge and know-how. The decision as to the amount of benefits is not ours to make. Our task is to provide security for payment of the benefits required by the workmen's compensation law and such further coverage as is necessary to meet the needs of those who desire the protection and service which we afford. Our task is not only the mathematical function of pooling risks, but the positive duty of eliminating hazards as far as ingenuity and care make that possible. The suggestion that private insurance carriers be eliminated from the workmen's compensation picture would deprive the employer and employee of the two advantages that government insurance inherently lacks — flexibility — and the standard for judging efficiency which competition alone can provide. The record of private carriers in the fields of rehabilitation and prompt payment of claims is ample proof of not only the need but the necessity of private enterprise in this field. It is the position of the National Chamber of Commerce that employers should be allowed to self-insure if qualified and to insure if they so desire.

Rehabilitation

What are the challenges of the future? Let me first consider rehabilitation. In essence, rehabilitation is the heart of the workmen's compensation system. It is our primary job. It is the actual fulfillment of the workmen's compensation idea. What happens in the future to the compensation system may in large part depend on what we achieve in this area. Management recognizes that it has the primary responsibility in this area, first from a humanitarian standpoint toward the worker as an individual, and second toward the worker as a productive unit in the industrial scheme.

What needs to be done? First, we must coordinate the activities of all those who are presently involved in rehabilitation programs. Second, we must undertake a program of employee education so that the injured worker becomes thoroughly familiar with the great potentialities that rehabilitation offers. This means we must speed up our referral processes so that specialists who are competent can deal with the injured workman at the earliest possible date. Employers, insurers, administrators and,

most important, physicians, must cooperate in providing expert professional services to the end that every remaining ability of the injured worker will be salvaged. This is not a job for the general practitioner, regardless of how skilled he may be in many phases of medical science, unless he has been specially trained as a rehabilitation expert. To accomplish the desired end, laws which retard the referral processes must be amended. Third, emphasis should be placed upon the worker returning to gainful employment rather than emphasis upon the disability and the payment of awards which hamper the full utilization of rehabilitation. Rehabilitation, it must be emphasized, is based not upon the disability but on the capabilities of the handicapped person. Fourth, employers must be educated as to the values and capabilities of the physically handicapped. The Chamber of Commerce recognizes that there remains a sizable reservoir of employable manpower among the handicapped and it is urging all employers to lend their support to the fullest extent possible in providing satisfactory placement of handicapped workers in suitable self-sustaining employment.

Safety Programs

What about accident prevention? The Chamber of Commerce recognizes that safety is primarily the legal and moral obligation of the employer. In order to carry out this responsibility, management must have the necessary authority. No steps should be taken which create confusion and uncertainty as to management's responsibility and authority. While recognizing that the responsibility rests with management there is a moral obligation on the part of the individual employee to cooperate in safety programs.

The challenge of the future in this field lies in two areas: first, in extending present safety work into broader areas and secondly, the need for study and research concerning the human factor in accident causation.

Greater efforts must be made to interest those employers and workers that are not now reached through present safety programs. Effort is now being made to reach these employers through the some 12,000 associations representing 3,000,000 employers and the more than 50,000,000 employees. Several hundred meetings a year promoting industrial safety are held by these associations. The Chamber of Commerce and many other similar associations are cooperating in this effort.

In connection with the development of research and more knowledge in regard to the human factor in accident prevention, we find a need for a high order of safety engineering. It must be based on a deeper understanding of man and his capabilities and his limitations in dealing with the stresses imposed upon him in this industrial society. Constructive teamwork between specialists in human performance and behavior — the anthropologists, physiologists and psychologists, the biostatisticians and epidemiologists — all have their roles to play. While there are fewer deaths and injuries today than there were in the past, and while we may expect a fewer number in the future, they are just as serious to the victims and just as serious to the over-all welfare of the industry. We must continue in our never-ending search to find a better means of preventing these tragedies of our industrial age.

Equitable Benefits

What about the adequacy of compensation benefits? The adequacy of benefits must not only be determined by the needs of the injured worker, but also by the capacity of industry and society to bear the cost. The challenge of the future is how we can best make use of the money that is available for the payment of benefits. The inefficient and inequitable distribution of the amounts available cannot be cured by merely raising the entire benefit level. There is a saturation point beyond which prices cannot be raised. It thus seems to me that the challenge of the future lies in seeking a more effective and equitable distribution of the amount of money that is available for benefits. In this connection, I would suggest several possibilities for study.

First, we should examine whether the relationship between the amount of compensation paid for various degrees of disability is proper. It is my opinion that the compensation structure today leaves those who are severely disabled in many instances woefully undercompensated while there are many who have received minor disabilities and who have been restored to jobs who are paid amounts of money far in excess of their needs or what was contemplated by the workmen's compensation statute.

Tort damage criteria is increasingly becoming entrenched in the compensation system. We are drifting away from the original concept of the system that indemnification should be for wages lost. There is a growing philosophy that when a person is injured regardless of whether he is disabled, he is entitled to some compensation to pay him for his pain, suffering and inconvenience. The money drained off through payments in such cases prevents adequate compensation to those who are more seriously and permanently injured and who are in greater need.

The workmen's compensation structure is like a pyramid with the totally disabled at its peak.

Attempts to raise the peak to a proper level brings with it an automatic increase in the amount that must be paid in the myriad number of cases at the base level. It is this latter group that consumes the larger portion of the compensation dollar. It is not this group, however, that is most deserving. Some consideration should be given to methods of raising the peak without raising in like degree the base level.

The second area deserving of our special attention involves the vast amount of existing and potential overlap between workmen's compensation and other public insurance programs. The overlap between workmen's compensation and old age and survivor's insurance, nonoccupational disability programs and proposed disability insurance programs are wasteful and inefficient. We cannot afford the luxury of double benefits and overlapping programs.

A third area of concern is the lack of proper demarcation between occupational and nonoccupational disabilities. The expense of the workmen's compensation program is bound to increase when the system must pay for injuries and diseases not attributable to the occupation. There must be a recognition that the workmen's compensation law is for the protection of workers against the hazards of employment and not an all-inclusive health insurance law. If the system must bear those elements of heart disease, loss of hearing and other natural health deficiencies which may be due to nonoccupational exposure, the dollars available for occupationally incurred cases will be less.

If a sincere effort is made to make studies in the foregoing areas, I am sure that many dollars can be freed to pay higher benefits to deserving disabled workers.

Radiation Hazards

I also want to mention an area of Congressional activity which bears our immediate concern and constant surveillance. In March, 1959, the Subcommittee on Research and Development of the Joint Atomic Energy Committee held exhaustive public hearings on the problems of employee radiation injuries and workmen's compensation. During the course of the six days of hearings some 40 expert witnesses, including representatives of employers, labor, insurance industry, the medical profession and both state and federal government, appeared before the subcommittee to present their views. Following the hearings the committee issued a comprehensive summary-analysis of the public hearings in which it made no concrete recommendations for legislation or other action at this time, but emphasized that the inquiry thus far indicated a need for further intensive study of the complex problems involved. The possible courses of action suggested in the summary-analysis contained a veiled warning to state governments to get their houses in order by setting up adequate safety standards and adopting appropriate amendments to the workmen's compensation statutes to cover radiation injuries. There are certain groups who have capitalized on these hearings and have used them as a platform to assert the incompetency of state administration of workmen's compensation. These groups claim that the radiation problem is of such a complex nature that the individual states cannot possibly regulate or adjust to it.

On this assertion there should be two things kept in mind. First, the industry is learning to deal effectively with these hazards. The best available data on injuries compiled for facilities owned by AEC show that from 1945-1957 only two deaths and 16 injuries occurred attributable to radiation. This involved a total of 200,000 workers and 2½ billion man hours of work. This is one of the lowest accident records in American industry.

Second, prior to the 1959 legislative sessions, the greater majority of the state workmen's compensation laws already covered the radiation hazard. In 1959, widespread legislative action in the field of radiation is particularly noteworthy as evidenced by the individual states in providing adequate coverage for employee radiation injuries. Now, all but three states provide compensation coverage for radiation injuries. Some 17 states passed regulatory laws in this area, most of which included provisions for studies of workmen's compensation laws and benefits as they relate to hazards in the use of nuclear power and radioisotopes. Eleven states broadened their statutes of limitations with respect to radiation injuries or latent diseases. Thirty states have established committees to study and advise on radiation problems. As is noted, the individual states have made progress; however, continued activity is needed and those of us who are interested in the preservation of state administration of workmen's compensation must bend every effort to improve our laws to meet this new challenge.

In conclusion let me say that we must shape our laws to serve our needs — let's not content ourselves in serving laws. The progressive development already made by the states and that to be made by them in the future in the fields of rehabilitation, safety, benefits and in the new area of radiation will provide, I am sure, a positive rebuttal to the arguments of those who see centralization of governmental power as the only way to workmen's compensation development.

A SURVEY OF DENTAL X-RAY MACHINES IN IDAHO

- W. O. YOUNG, D.D.S.
- HOWARD L. BURKHARDT
- MELVIN ALSAGER

In 1958, during a series of district dental society meetings, a prominent roentgenologist discussed x-ray techniques and methods of reducing radiation hazards. Following the series of meetings all of the dentists in the state were invited to have their machines surveyed and operating techniques observed. The survey was conducted under the responsibility of the Engineering and Sanitation, and Dental Health Sections of the Idaho Department of Health.

In all, 283 dentists were contacted with 206 or 72.8% responding. There were 195 requests for surveys, six requests for only lead washers and aluminum filters and five stating that they had moved or retired. To date, 200 machines owned by 194 dentists have been surveyed.

The survey of the machines consists of (1) a visual check of the condition of the machine (2) the determination whether adequate aluminum filtration and a lead washer are installed, and (3) a check of the condition of the tube housing shielding with a radiation survey meter. In one office the use of an aluminum filter and lead washer reduced the scatter in the room by a factor of twenty.

The exposures received by the dentist and his assistant while in their normal positions were also measured. It was a general recommendation that whenever possible they move out of the room or behind a protective screen.

It has been found that the latest equipment and techniques will reduce the total exposure during a full mouth series to the same level as a single exposure with older methods. Recommended operating technique changes were: (1) operate at a higher voltage and lower amperage, (2) use high speed film, and (3) underexpose and overdevelop the film. Whenever technique changes were made, it was recommended that only one be made at a time to avoid retakes.

After examining several machines, it was determined that the x-ray manufacturers were conforming with the limits established by the National Bureau of Standards in Handbook 41 for radiation leakage through the tube housing. Whenever excessive readings are found it is recommended that the manufacturer be notified. In one instance when excessive leakage was found, the manufacturer stated it impractical to reduce the leakage from this machine. After the tube and housing were returned to the dentist, a recheck showed that the leakage had been reduced to 1/10 the recommended limit (0.1 Roentgen per hour at one meter).

One serious example of ignoring good procedures was discovered during the survey. It was found that whenever the tube head was extended on one machine, it would slowly settle. The dentist would then hold the tube head to prevent its moving. His other hand was kept occupied by holding the film in the patient's mouth. To increase his troubles, the tube head leakage was several times the recommended level.

The most extraordinary machine surveyed was one of a 1929 vintage. Although the tube housing was constructed of leaded glass, the radiation leakage from the tube was surprisingly low. A wire basket extended from one end of the machine to enclose the bare high voltage leads. The electrical hazard created appeared to be greater than that from radiation.

Before washers and filters were sent out it was found that the equivalent filtration in 161 machines was less than 2.5 mm of aluminum. Nineteen machines had 2.5 mm and 20 had an unknown amount. Before the program was initiated the beam diameter of 100 machines was 2.75 inches. Seventy-one were larger than 2.75 inches and 29 unknown. Emulsion ratings of film used at the time of the visits was: 120 used fast, 67 intermediate, 6 slow and 7 unknown.

The operating kilovoltage varied to a large degree. It was determined that: 11 operated at 50-53 kilovolts, 117 operated at 65-67 kilovolts, 29 operated at 70-72 kilovolts, 15 operated at 80-90 kilovolts, and 18 at unknown kilovolts.

It was found that 11 machines still in use were manufactured before 1935, 23 were manufactured from 1935-1944, 44 from 1955-1960 and 20 had an unknown date of manufacture.

The primary purpose of the survey was to inform the dentist and increase his awareness of x-ray hazards. During the survey the approximate radiation levels in various positions were measured and the best locations to stand were established. Although in most instances radiation levels did not approach the maximum allowable limits, all recommendations made were based on the philosophy that unnecessary radiation exposure should be eliminated.

Dr. Young is Chief, Dental Health Services, Idaho Department of Health, and Mr. Burkhardt and Mr. Alsager are Public Health Engineers, Idaho Department of Health.

Books

The American Academy of Orthopaedic Surgeons, Instructional Course Lectures, Vol. 17

Fred C. Reynolds, M.D., Editor. $18.50. Pp. 421, illustrated. The C. V. Mosby Co., St. Louis, 1960.

This handsome, oversized and profusely illustrated book represents a portion of the educational course content for trainees in The American Academy of Orthopaedic Surgeons. Presumably these programs stand in some relation to preparation for board examinations in that specialty. The contents are divided into four major portions: Fractures, Bone Graft Surgery, Children's Orthopaedics, and Athletic Injuries. In further exposition of the contents, the details under one major division, Athletic Injuries, are now indicated:

Symposium on Athletic Injuries; Mechanism of Injury to the Musculotendinous Unit; Overuse Syndromes of the Lower Leg and Foot in Athletics; Injuries of the Hand, Wrist, Forearm, and Elbow Sustained in Organized College Athletics; Unusual Athletic Injuries; Injuries to the Shoulder Girdle.

Outstanding as this book is for orthopedic surgeons, it is not for the usual industrial physician as he goes about his plant or administrative duties. For the exceptional industrial physician or surgeon whose individual bent is toward orthopedic surgery this book is pure gold, just as it is for all orthopedic surgeons.

The Chemical Analysis of Air Pollutants

Morris B. Jacobs. $13.50. Pp. 430, illustrated. Interscience Publishers, Inc., London, 1960.

It was inevitable that as air pollution reached the status of a major scientific pursuit, there would appear books devoted to the chemical analysis of air pollutants. That time has come and that book has come. As a rule the early book offerings related to a developing science are prone to be juvenile in quality and scope. Not so in this instance. This book was born big and mature. No disparagement may be found in that statement that much that is presented has been applied in cognate fields such as industrial hygiene, toxicology, and general chemical analysis. Equally true, not all the chemical and physical procedures represent the work of the author although he directly has contributed mightily to analytical chemistry. This is a book of collation, assembly, critical appraisal and stamping of approval. All this the author has organized under these major headings:

Sampling; Measurement of Gas Volume, Quantity, and Velocity; Sootfall and Dustfall Analysis; Atmospheric Dust Evaluation; Suspended Particulate Matter; Smoke Density and Smoke Shade; Stack Sampling and Analysis; Sulfur-Bearing Air Pollutants; Halogen-Bearing Air Pollutants; Nitrogen Compounds and Ozone; Carbon Oxides, Cyanide, and Phosgene; Organic Compounds; Radiochemical Determinations; Incinerator Flue Gas Analysis; Motor Vehicle Exhaust Gas Analysis; Odor Analysis; Air Contaminant Monitoring Instruments.

These major topics have required elaborate subdivision until it comes about that the full table of contents occupies nine pages of small type. Taking "odors" as one example, that topic is explored as to chemical and physical analysis through these items:

Objective Odor Methods: Adsorption on Activated Carbon; Oxidimetric Method; Chemical Methods.

Dilution Methods: Syringe Dilution Method; Osmo; Flow Dilution System; Nader Method; Scentometer.

Direct Odor Evaluation.

It would be an ambitious author and chemist who at any early time would attempt to make this present text obsolete. Air pollution for a long time to come will make this book its analytical hitching post.

Nuclear Radiation Engineering

F. W. Hutchinson. $6.00. Pp. 155, illustrated. The Ronald Press Company, New York, 1960.

Just now those writers of books on nuclear radiation intended only for those in cognate sciences at the brim of atomic energy, usually are careful to include in their title the words "an introduction," or "a primer." Most physicians and most industrial engineers are only bold enough to grapple at that level. This is made clear in some language from the author's preface:

"As the fields of atomic physics and nuclear engineering broaden and deepen into complex specialties, the need — paradoxically — becomes ever greater for a larger number of technically informed nonspecialists. Such persons—often administrators or engineers who are themselves specialists in other fields — must know the fundamentals of atomic structure, the source of nuclear energy, and the principles of radioactivity. They must be able to speak the language of both the physicist and the engineer. They must possess sufficient knowledge of the atom and its

nucleus to be able to understand and discuss the type of problem on which the specialist is at work. And, above all else, they must retain an over-all point of view which will enable them to see clearly the particular place in the general order of things that is occupied by the work of the specialist. This book is intended specifically for these persons who are situated at the rim of the atomic circle, rather than for those who are committed to detailed work within that circle.

"This book is also intended to serve as the equivalent of a language primer—as a means of improving understanding between the executive and the atomic scientist or nuclear engineer with whom he must communicate. At present there is an industrial language barrier which causes concern on the part of the executive when he is required to make a decision based on advice or evidence which he does not fully understand, and annoyance, irritation, and resentment on the part of the competent specialist who feels that his reports are mistrusted. Thus one major purpose of this book would be achieved if the reader found that his increased vocabulary enabled him to communicate more freely and confidently with specialists."

Lately it has been claimed that matters of nuclear energy should be taught in the first grade of school and may be grasped by these first graders. To some of us born too soon to have enjoyed this first grade boon, there appears to be no simplicity in any part of atomic energy lore. Yet this author comes close to simplicity. The author may regard as the least of his achievements the glossary at the end of the book. For some that is the closest to understandability. Yet take just one term and one definition: "auger Electron: A special type of double transition of orbital electrons involving no emission of radiation outside of the atom, but loss of one electron."

That still is mighty confusing.

Harmful Effects of Ionising Radiations

Ethel Browning. $3.00. Pp. 158. Elsevier Publishing Company, New York, 1959.

Left to her own preferences, Dr. Browning might have sought to avoid any presentation of the physics of ionising radiation. Always that is disconcerting to nearly all industrial physicians. But the introduction of some physics was unavoidable. The fulfillment of that obligation has been accomplished with restraint. Her purpose is well set forth in this quotation:

"This monograph represents an endeavour to reduce the essential facts to proportions which provide for those who need it, an insight into the most outstanding problems without overburdening their time and attention. These problems are envisaged primarily from the point of view of industrial medical officers, safety officers, and workers engaged in this field of industry, but the general population cannot now be separated from the industrial with regard to the possible biological effects of atmospheric radioactive contamination. It has therefore been found necessary, for the sake of balance and completeness, to include sections on the long-term potential hazards, such as leukemia and genetic effects."

The author's forte is the clinical. With all the lucidity and simplicity of an essay on chicken pox she has presented all the risks and clinical facts of ionizing radiation. This she achieves in four brief chapters without wasting a single word. Those four chapters cover in a fashion sufficient for the industrial physician, such items as are now indicated:

Acute and subacute effects: The Acute Radiation Syndrome; The Subacute Syndrome; Acute Effects on the Blood; Protective Action of Various Drugs; Acute Effects on the Skin; Effect of Acute Exposure to Ionising Radiations on the Hair.

Chronic and delayed effects: Effects on the Skin; Effects on the Bones; Effects on the Blood; Effects on the Eyes; Cataract; Effects on the Gonads; Effects on the Thyroid, Pharynx and Larynx; Effects on the Lungs; Effects on the Liver.

Leukaemia: Leukaemia and Radioactive Strontium; Types of Leukaemia; Symptoms and Blood Picture of Leukaemia; Radiation-Induced Leukaemia.

Genetics: Radiation-Induced Mutations; The Mutagenic or Doubling Dose of Radiation; Nature of Genetic Effects; Shortening of Life by Irradiation.

The usual physician resents having to make the acquaintance of even the medical aspects of ionizing radiation. His few sorties into profound presentations have left him baffled and frustrated. This one is different. It leads to rejoicing.

Respiration, Physiologic Principles and Their Clinical Applications

P. H. Rossier, A. A. Buhlmann and K. Wiesinger. Edited and Translated into English by Peter C. Luchsinger and Kenneth M. Mosser. $15.75. Pp. 505, illustrated. C. V. Mosby Co., St. Louis, 1960.

A continuing handicap to the full understanding of those occupational diseases that involve the respiratory tract is the overemphasis on the

anatomy and morphology of the respiratory organs. Conversely, there long has been underconsideration of the abnormal functioning of the tissues involved. This is the thesis of this book of German origin which is little devoted to occupational diseases and instead to respiration in health and in abnormal states in general.

This book is divided into four parts, the first of which is the "Normal Physiology of Respiration" which part is introduced by this language:

"Fundamental to the proper interpretation of both normal and deranged pulmonary function tests is the need to regard respiration as an interrelated chain of events which includes external ventilation, gas exchange within the lung, gas transport within the blood, pulmonary hemodynamics, and, finally, the neural regulation of all of these processes."

Part One, therefore, is devoted to a consideration of the basic physiology of respiration. The subject has been divided into five sections; namely, pulmonary ventilatory function, the transport of respiratory gases in the blood, the exchange of respiratory gases between alveolus and blood, the neural regulation of respiration, and, lastly, certain aspects of tissue respiration. The sixth and seventh chapters of Part One are concerned with the fundamental basis of cyanosis and dyspnea.

The second part, and perhaps the most important part, is entitled "Investigative Methods in Pulmonary Function." Therein is reviewed the more important investigative methods employed in pulmonary function testing. The aim here is to present the principles involved and to forego detailed description in most instances. The equations and correction factors concerned with certain of the methods are summarized in the appendix of this book.

Since spirometry is the most commonly employed method for studying pulmonary ventilation, this technique is discussed in some detail. However, there are presented here other important methods of assessing pulmonary function, including those required for accurate determination of the mechanics of respiration and the composition of the alveolar air.

Part Three is captioned "Pathophysiology of Respiration." The major portion of this division is devoted to the characteristics of the different types of pulmonary insufficiencies.

Part Four bears the caption of "Pulmonary Insufficiency in Clinical Practice." Among the specific pulmonary diseases explored are: emphysema, bronchial asthma, stenosis in the major airways, functional disturbances in pulmonary tuberculosis, primary pulmonary sclerosis, pulmonary embolism, pulmonary thrombosis and pulmonary infarction. Two chapters that stand somewhat apart are: "Oxygen Deficiency and High Altitude Breathing," and "Pulmonary Function in the Athlete."

These German authors state that the measurement of pulmonary capacity has become a comparatively easy task. If this be true a mighty service will be rendered to a host of physicians long troubled by unsatisfactory procedures connected with appraisal of the degree of impairment of those workers afflicted with silicosis and other disabling dust diseases.

Occupational Allergy

Netherlands Society of Allergists. $10.00. Pp. 329, illustrated. Charles C. Thomas, Publisher, Springfield, Ill., 1959.

This book consists of the lectures presented at the Hague in May, 1958, organized by the Netherlands Society of Allergy in cooperation with the Netherlands Society of Occupational Medicine, under the auspices of the European Academy of Allergy.

This book is no comprehensive text on occupational allergies. This book is spotty in its coverage. This spottiness is its major virtue since the emphasis is on newness in occupational allergy. Its chief appeal is to the specialist in occupational diseases or in dermatology, instead of the academic student in either occupational health or dermatology. Much that is new is reflected in lecture topics some of which are now mentioned:

Occupational Sensitization of the Upper and Lower Air Passages by Organic Types of Dust; Kapok Allergy; Allergy to Oil of Turpentine; Occupational Allergy in the Pharmaceutical Industry; Occupational Problems for Patients with Besnier's Prurigo; Occupational Allergy in the Bakery; Respiratory Allergy in the Medical Profession and its Auxiliaries; Occupational Eczema in Those Who Print Cotton by Hand; Occupational Eczema in Therapists; Contribution to the Study of Asthma Amongst Mineworkers; Allergic Reactions in Nurses; Formaldehyde as a Contributing Factor in the Development of Allergy to Wood Dust; Evaluation of Test Reactions to Detergents; Rhinitis and Dermatitis Caused by Exotic Woods; Occupational Allergy in Printers; Allergic Reactions in 543 Cigar-Factory Workers; Coffee and Occupational Vapor Allergen.

Other sections are far more general, dealing with definitions of occupational allergy, standards of diagnosis, methods of diagnosis and examination, therapy in allergic reactions, prevention of occupational allergies and the social significance of occupational allergy. Such por-

tions of the book conform to the requirements of a text book.

The publishers of this book have not well served either the contributors or the prospective buyers. This book like some others lately published in Europe is not well bound. It bulges; it gapes; unless weighted down it threatens partly to open up in edematous fashion. Mildly this book looks as if it had been left out in the rain for a few minutes then hastily dried. There are numerous errors that customarily would be termed "typographical" but more likely are those of a translator not fully competent in English. For example, the last line of the book contains the language . . . "familiar with reaction patrons of the skin," when presumably "patterns" was the intended term. Yet withal the scientific presentations atone for a fair amount of mechanical defection.

Textbook of Toxicology

K. P. DuBois, E. M. K. Geiling. $6.50. Pp. 302. Oxford University Press, New York, 1959.

Any book subjected to review deserves to be judged in keeping with the ground rules laid down by the author. These authors in their ground rules indicate that this is no comprehensive opus for the guidance of the master toxicologists. Instead its design is for an elemental text for the training of medical and pharmacy students. That design leads to the following divisions: Historical Development of Toxicology, General Principles of Toxicology, Medicolegal Aspects of Toxicology, Air-Borne Poisons — General Considerations, Air-Borne Poisons — Gases, Air-Borne Poisons — Dusts, Corrosives and Phosphorus, Metals, Radiation Hazards, Alcohols and Other Industrial Solvents, Nitro and Amino Compounds, Pesticides, Food Poisoning — Plant and Animal Poisons, Household Poisons, Toxicological Analysis.

It may be observed that some three-fourths of this text is concerned with industrial toxicology. That may reflect one or both of two situations. Either the identifications of the authors are so close to industry as to have provided wider experience in that territory or else industrial toxicology has overshadowed other areas of toxicology. Either explanation stirs up gratification that at last one general toxicology text is dominated by industrial toxicology. This book merits acclaim as an elemental text duly factual but with emphasis on readability.

The author's ground rules made no reservation as to the right to hamper this book with a small number of errors or maladroit statements. At one point the Burtonian line of lead absorption is described as "black." The Burtonian line characteristically is purple or blue. That is one of the cherished mysteries of industrial toxicology. By no odds may that transformation into a black line be condoned. On one page tetrachloethane is presented as a common industrial solvent, while on the preceding page it is mentioned as one that has "almost disappeared." After noting with propriety that it is difficult to define a poison, the authors then provide this definition: "A poison, however, can be defined in general as a substance that produces such a physiological disturbance as to imperil health when it is absorbed into the system." That word "absorbed" is the key word. Yet on the next page a number of local irritants are listed that are not absorbed. These are not poisons by the author's own definition. Such discrepancies little mar this book. If only that perfect book free of all imperfections is to be hurled at the head of offending authors, few will suffer injury.

For the casehardened toxicologist, little excited over the MAC for acrylic aldehyde or anything similar, the most engaging portion of this pleasant book is that long section on the history of toxicology throughout the centuries. Writing of Arabic medicine about the year A.D. 1000 mention is made of that Persian, Avicenna, whose full name was the formidable Abu Ali el Hosein Ebn-Abdallah Ibn-Sina. His five volume system of medicine is credited as having been read by more persons than any other medical writing in all of time. Late in life Avicenna, sated with fame and fortune turned to riotous living. So living he indulged too freely in a mithridatic, the universal antidote — and then no Avicenna.

Outline of Orthopaedics

John C. Adams. Third Edition. $8.00. Pp. 448, illustrated. E. & S. Livingston, Ltd., Edinburgh. American publisher: Williams & Wilkins, Baltimore, 1960.

This small volume was primarily written for students and general practitioners. All of the common and some of the rare orthopedic conditions are described, but the description is brief. For example, four pages are given to the subject of prolapsed lumbar intervertebral disc.

The book is well illustrated and there are many practical points in regard to the examination of the patient. The discussion of each subject is too brief for this book to serve as an adequate reference for the average industrial physician or surgeon.

INDUSTRIAL MEDICINE AND SURGERY

ESTABLISHED 1932

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March, 1961

VOLUME XXX

NUMBER 3

How Much Health Do Workers Really Want?

When in 1700 Ramazzini published his always famous *De Morbis Artificum*, copies sold like a four-star newspaper extra on many street corners in his city. The buyers were workers themselves. There is no known report that since that time this phenomenon has been repeated. The development of occupational health has never been characterized by eager demands on the part of workers themselves that health be a major consideration in over-all industrial planning.

Berwyn Mattison, writing engagingly in the *Baltimore Health News*, (November, 1960) under the title "How Much Health Do We Really Want?" emphasizes that among people generally there is at the present time a lag in motivation to health procurement. Wherever in that writing Mattison uses the term "public health," the term "occupational health" may be substituted without violation of the author's intent. Much will become clear through presentation here of a number of excerpts from the Mattison publication:

"Most of us in the public health profession should be rather sophisticated with regard to attitudes about health. Occasionally (but not as frequently as we should) we realize that amongst our own peers the struggle for existence has given way to what Julian Huxley has called 'the struggle for fulfillment.' In this process many of the popular pressures for public health programs and services as we used to know them have been lost. For instance, in those days when nearly every family had suffered from tragedy due to diphtheria or scarlet fever, or infant diarrhea, was it not inevitable that individual and community pressures for a child health program would have been greater than they are now? We fight harder to survive than we do to enjoy that survival."

"Neither does our country with all of its advantages and all of the progress of which we are so proud have a right to lay sole claim to leadership in the health field. As a matter of fact, mortality from our two leading causes of death is considerably above that for several of our more or less comparable sister countries. In 1958 the U. S. level of mortality from heart disease was above that for Canada, England, Italy, Sweden, Denmark and Norway; and from cancer, our level was again above that for Canada and

Israel, although here we showed a more favorable position with regard to England and the Scandinavian countries.

"Nor are these wide variations of health and disease patterns in different parts of the world the only contrasts with which we should be concerned. For right here in the continental United States regional differences of considerable magnitude exist and must be understood if we are to clarify the question of how much health people want. For instance, the age adjusted incidence rate of cancer of the breast in white females is between 20 and 30% higher in the west than in the north or south, according to data collected by the National Cancer Institute; while cancer of the mouth in white males occurs about a third less frequently in the north than it does in the south or west; and it has long been recognized that cancer of the skin in white males varies as much as threefold between the north and the west and as much as fourfold between the north and south. One study indicates more than four times as much cancer of the larynx in urban males as in rural males. Thus, place, whether it be within the United States, in other highly developed countries or in some of the developing countries, would seem to be a factor associated with different health patterns and presumably therefore with different health wants."

"The popular images of glamorous women and successful men created by the advertising people and the movies, usually include cigarettes and some form of alcoholic beverage. In spite of the growing concern of public health authorities about the extent of chronic alcoholism and a growing mass of evidence of an association between excessive cigarette smoking and lung cancer, the sale of these articles continues at an all time high. Which do we want — to guide our lives by scientific statistics towards some ill defined and unfelt state of future advantage, or (subconsciously, perhaps) be like the 'man of distinction' or the beautiful girl in the cigarette ad?"

"With all of these changes in our socioeconomic circumstances relating to health, it is vital that we adopt new criteria for measuring health. Long outdated are the simple mortality figures of Farr's day; and almost equally outdated is reliance solely on reported morbidity figures. Now we must concern ourselves anew with measurements such as the new indices used by the U. S. National Health Survey: for instance, restricted-activity days, bed-disability days, work-loss days, and school-loss days. These are approaching the more sensitive indicators that we need for the refinement and sophistication of our health programs today.

"However, I should like to suggest that we need other kinds of indices as well. We need new ways of measuring the resistance of individuals and groups to stresses, be they physical or emotional. Perhaps some of the experience in testing groups of volunteers for travel in outer space may ultimately give us some leads as to useful indices to be applied closer to home. Another possible source of useful information is the studies of the relationship between vehicular accidents and psychological traits now being carried out in different parts of the country.

"It should be possible even with our existing knowledge to establish more frequently than we have the 'profile of resistance' to disease characteristic of any community or group. Whether we use records of immunization with agents of known effectiveness or whether we use a sampling technique actually to measure antibody levels, this kind of profile is now feasible with regard to a number of diseases."

"We have passed the stage of concern over simple survival — now we must expand our health horizons to include physical and mental performance levels; to encompass the measurement of emotional depth and stability; to comprehend the evaluation of family solidarity and group interpersonal relationships. There was no lay demand for increased parameters of human experience in outer space, for the development of untold new sources of energy, for speeds not seriously visualized by the man on the street; dedicated technicians kept thrusting forward in those fields. It is up to us as the dedicated technicians in health promotion and the prevention of disease to do likewise. What 'people' may 'want' in the way of health on any particular day is not enough. Understanding their wishes, we must utilize new criteria to open fresh vistas, not just of disease avoidance, but of productiveness, individual happiness and group accord which will be so inviting they cannot fail to follow."

Occupational health will make a substantial stride if there develops less necessity for handing health down to workers and, instead, more insistence on the part of workers themselves that their health be a matter of concern.

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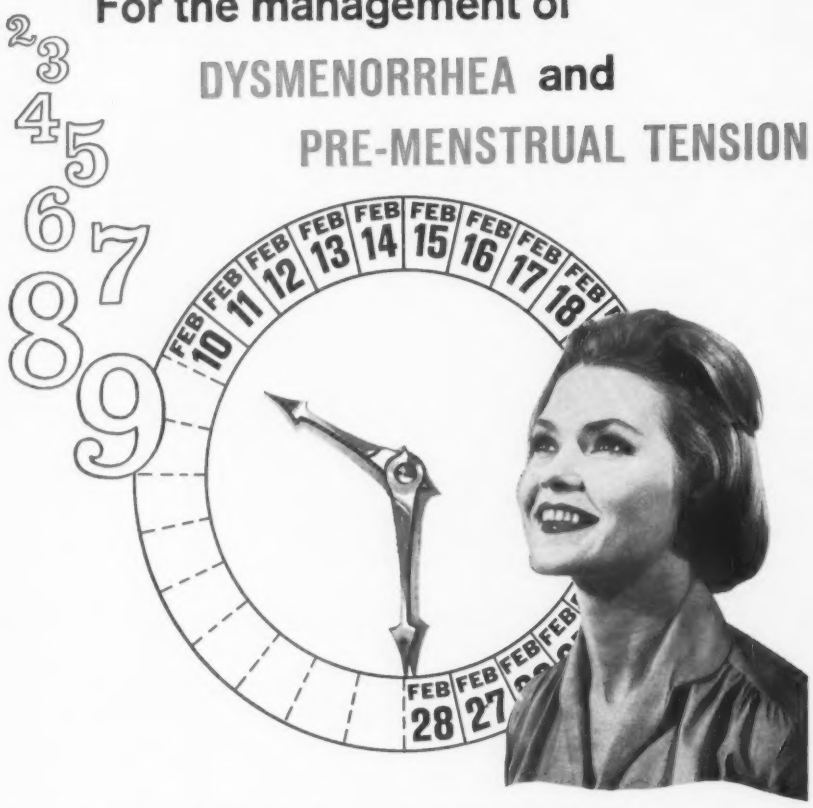

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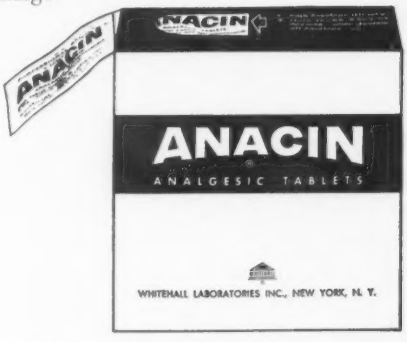

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COMMENT AND OPINION

Cardiac Revival

The American Heart Association has announced 20 half-day courses in nine cities in which physicians will be instructed in a new, nonsurgical method of restoring the beat to a stopped heart. Known as "closed chest cardiac resuscitation," the new technique has received wide attention since it was first described some months ago by a team of Johns Hopkins Hospital scientists.

Previous methods of starting up a stopped heart either required administering an electric shock or opening the chest in order to massage the heart by hand. In the closed chest technique, reliance is placed primarily on controlled, intermittent pressure of the hands placed over the patient's breastbone.

When correctly applied, this method has been found successful in restoring the heartbeat in 70% of cases. Its application by untrained persons is not without hazard, however, and for this reason the professional teaching institutes have been arranged. Physicians invited to attend the first 20 courses will be expected to conduct similar teaching sessions for other doctors in their home communities, the Heart Association said, with a view to disseminating information on the new technique throughout the United States. It is not planned at the present time to teach the method to nonprofessional persons.

Information Guide

Dr. Perry F. Prather, Maryland's State Director of Health, has recently released a new publication entitled *A Guide Book Describing Pamphlets, Posters and Films on Health and Disease.* This 175-page paperback book is an annotated reference volume to free or inexpensive health information materials selected for general use and is designed for persons seeking guidance in these matters for

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individual or group use. Dr. Prather has said the new publication may be useful to medical and safety personnel in business and industry.

The Guide Book lists 1,440 printed items and 244 films and filmstrips dealing with the various health subjects of interest to the general public. For each item listed there is a brief description, a suggested audience level, publication date, source, and cost, if any. Arranged in dictionary form, the topics covered range from accidents to x-rays.

The cost of the Guide Book is $1.00 per copy which includes the periodic supplements. Quantity rates will be quoted upon request. Inquiries should be addressed to: Health Education Services, Maryland State Department of Health, 301 West Preston Street, Baltimore 1, Maryland.

Planning Ahead

Recognizing the interest and importance of the so-called retirement years, Red Cross Nursing Services has introduced a new course entitled "Fitness for the Future." This four meeting course will answer questions and encourage realistic planning to help people prepare themselves physically and psychologically for their later years.

Topics for discussion include physiological changes resulting from aging, elements of a good health examination, good health practices, how to avoid accidents in the home, mental hygiene, uses of community resources in view of increased leisure time, and changes in family relationships as years pass.

From this discussion course it is hoped that students will understand the aging process more clearly, will learn to evaluate their own physical, mental, and social health, and will develop personal habits and attitudes that will help them have a longer and more satisfying life.

Good Die Young?

People who are considered healthy — those with the fewest chronic diseases, illnesses and other ailments — are not usually "good," as judged by the values of our society, according to a researcher on problems of human ecology.

Lawrence E. Hinkle, M.D., Associate Professor of Clinical Medicine at the Cornell Medical College, said that frequently the healthiest people in any group have purely personal or selfish goals and are concerned primarily with their own comfort and security. Dr. Hinkle has directed a study program in human health and the ecology of man at the Cornell Medical College since 1954.

These "healthiest people" have been described by our psychologists as "isolated, insulated people who don't let things bother them," Dr. Hinkle said. "A great many behave as if they felt no deep responsibility for the welfare of other people."

On the other hand, among those people in each group who are "least healthy," are those who are described as being "outwardly directed" and as having "socially determined goals." They often want to improve their status, get

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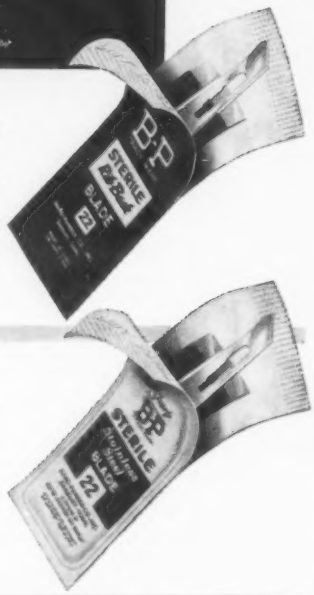

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ahead in life, be a good son, do something creative or fight for a better social system. These "least healthiest" usually have a considerable emotional involvement with other people. "Many often behave as if they were wholly responsible for the welfare of others — people for whom they may not necessarily have any direct responsibility at all."

Thus, a person in good health does not always have other characteristics which are socially valuable. "Healthy people are not necessarily more creative, productive, responsible, respected, successful, compassionate, honored or emulated than other comparable and less healthy people in their own social group," according to Dr. Hinkle.

In fact, often the personality characteristics of these "healthiest people and the social value placed on their behavior make them much less attractive people than some others who are less healthy," he said.

Why we find that the "normal" are often not "healthy" and the "healthy" often not "good" can be explained by various reasons. One, a purely statistical one, is that "the number of discrete organizations within a given man, from molecules to organ systems, is very great, and the number of possible configurations of these organizations is very great, also." We would be naive to expect a dynamic organism living in a constantly changing environment to maintain itself in an unchanging ideal state, he said.

But, perhaps a more important reason, Dr. Hinkle said, is that "life in any human society requires a constant curbing, postponement and modification of basic drives" — drives which are aimed at maintaining a steady state in man by coordinating physiological processes. The restrictions which life places upon the satisfaction of these biological drives of the individual very likely in the end lead to the numerous minor ailments which make up about 80% of all illness.

"Certainly we can hope that, in the future, the roles of men in their society can be so organized, and the men so fitted to them, that the lives of most people can be carried out with a minimum of pain and disability. Yet one can legitimately doubt whether the highest human goals, or the most complex and responsible social roles, will ever be fulfilled by men except at some cost to their health," Dr. Hinkle concluded.

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*A modification of the Price Hand Washing Test (Journal of the American Medical Association, 111, 1993-96, 1938), as performed by an independent microbiological testing laboratory (name on request).

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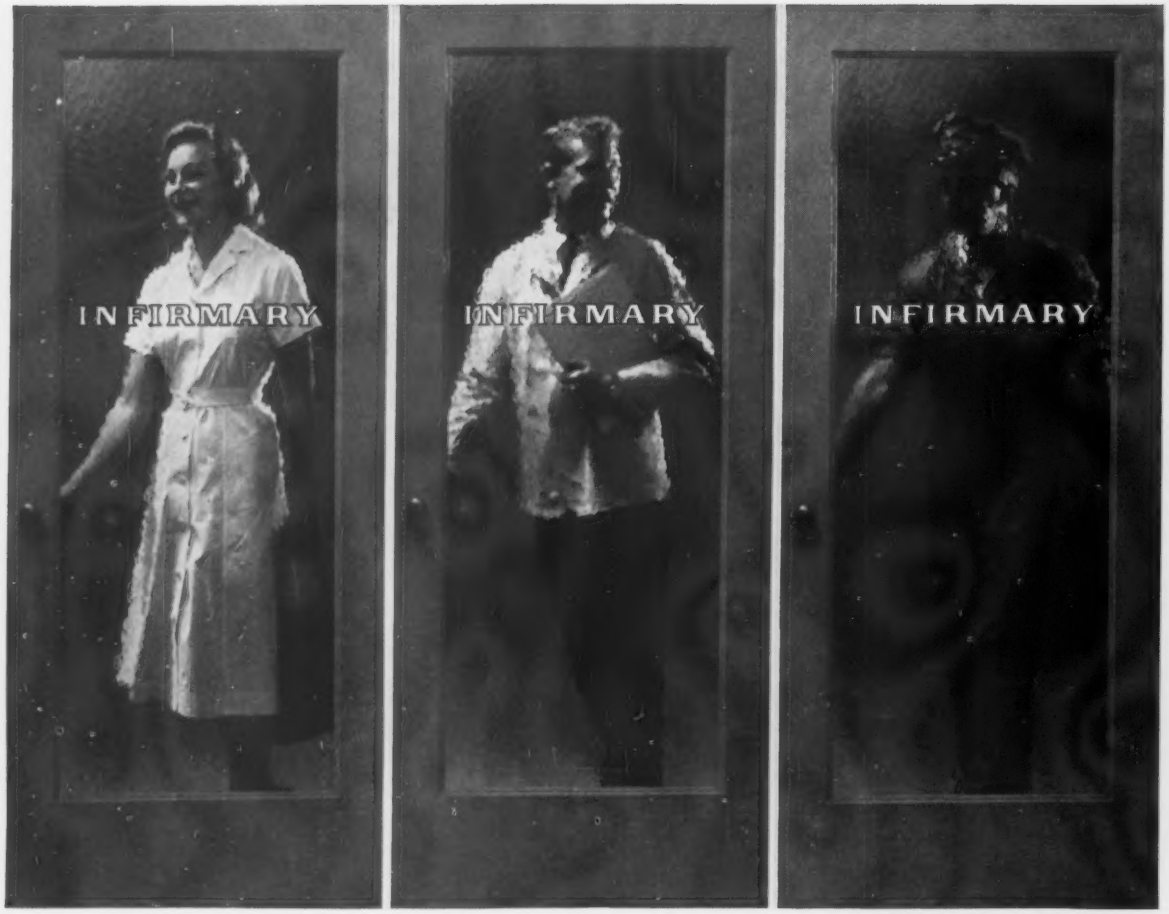

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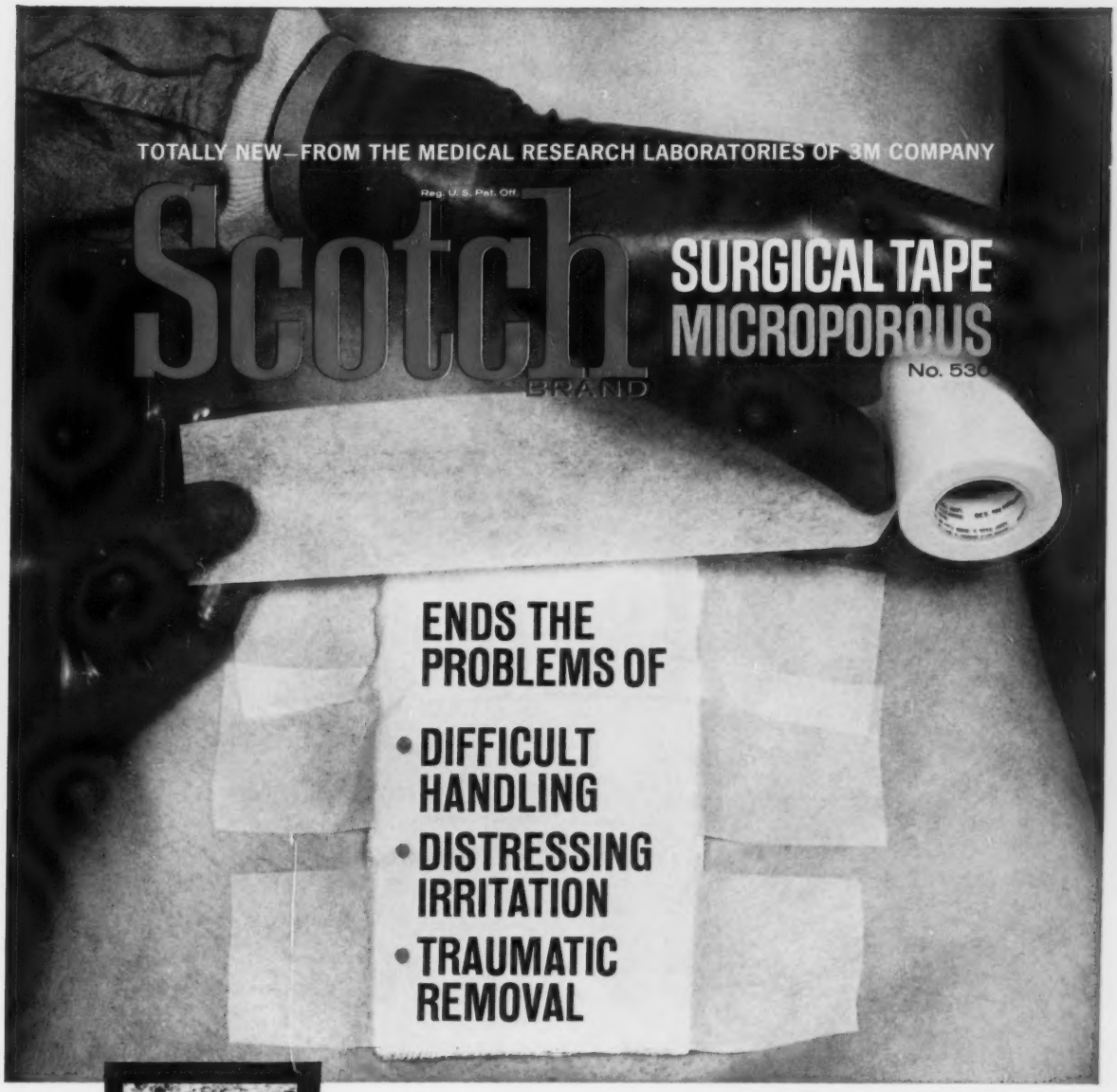

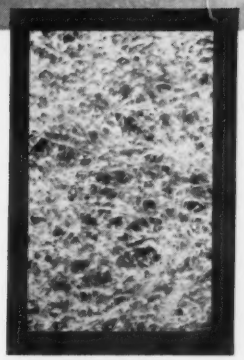

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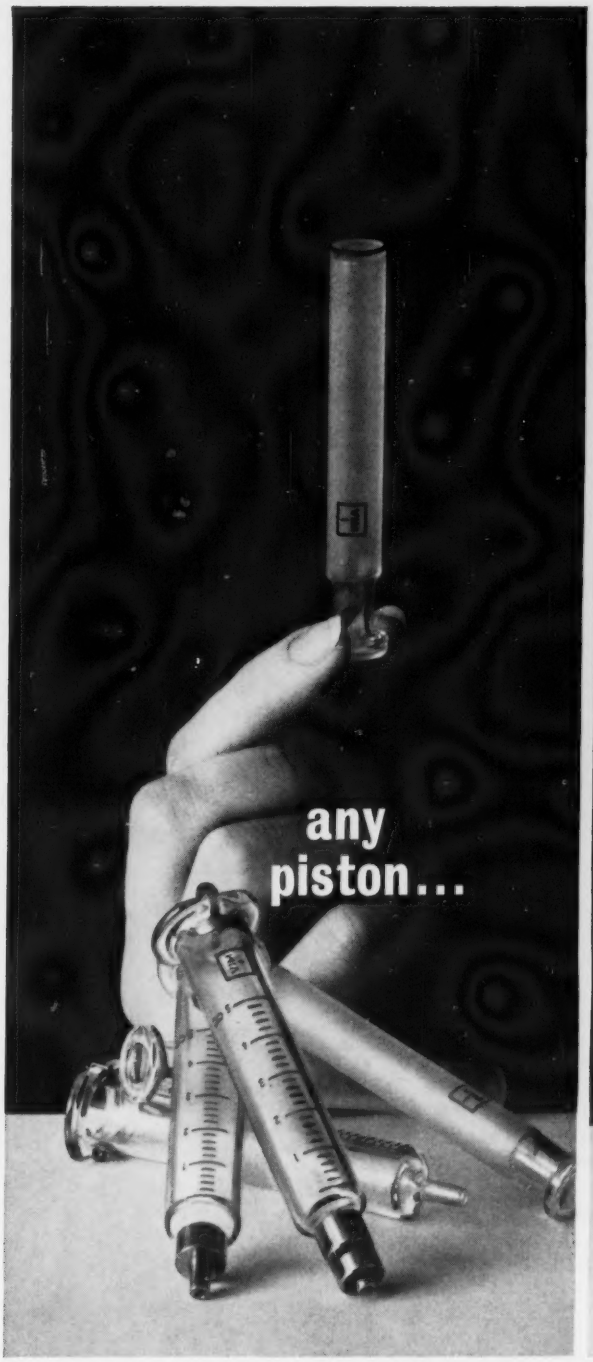

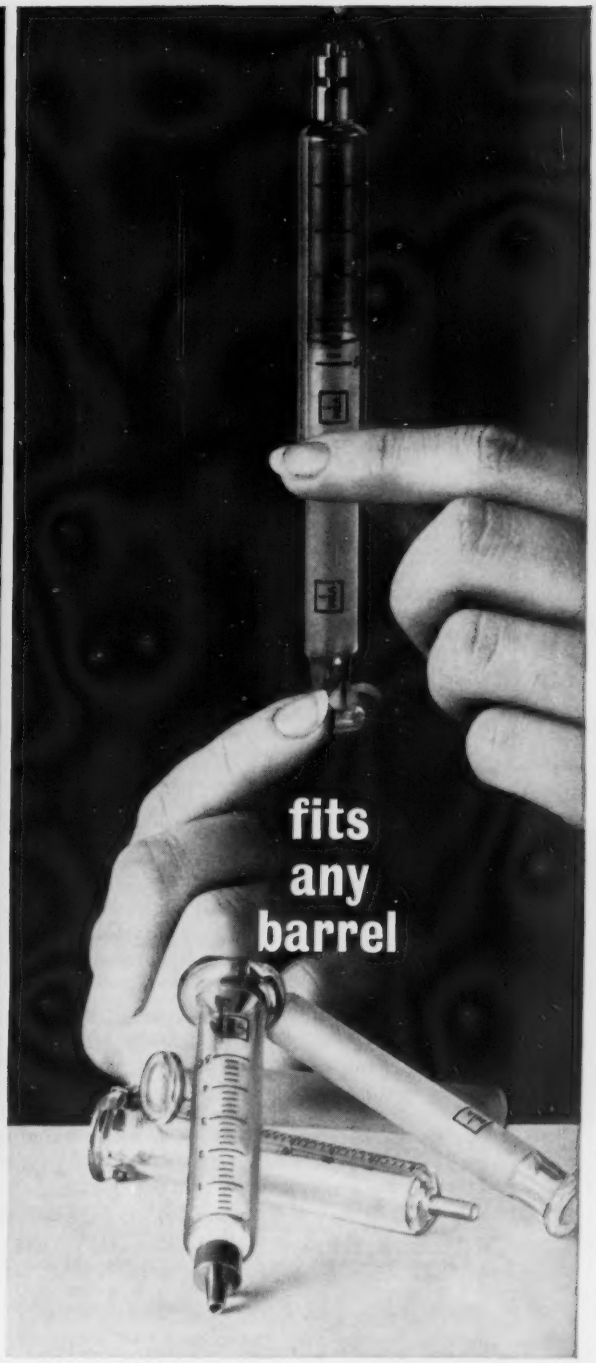

VIM® CLEAR BARREL INTERCHANGEABLE SYRINGES

☐ **Complete line** in **3** tip types—glass, metal Luer, Luer lock—and all sizes are completely interchangeable. ☐ **Greater durability** of **moulded** (not ground) clear barrel, which reduces friction wear, ensures longer life of syringes. ☐ **Exact control** of dosage is assured by greater visibility of markings and medication. ☐ **Precise tolerance** of pistons and barrels safeguards against chance contamination. Warning of inadequate syringe cleaning may be signaled if piston does not operate smoothly in barrel.

CYANAMID

SURGICAL PRODUCTS DIVISION

AMERICAN CYANAMID COMPANY, 30 ROCKEFELLER PLAZA, N.Y. SALES OFFICE: DANBURY, CONN.

Producers of VIM® Hypodermic Syringes and Needles

No. 7 *in a series of washroom survey comments from "SBS soap counselors"*

They asked us how to combat hard-to-remove soils!

George Y. Schombert

is the soap counselor who has helped many plants find economical solutions to skin hygiene problems. Here's his case history report of conditions at an Eastern steel mill:

"Workers in this steel mill come in contact with many hard-to-remove greases, tars, chemicals and paints that are potential irritants. In the Coke By-Products Plant, for instance, a too high percentage of workmen showed signs of rough, cracked hands due to the use of harsh solvents as a hand cleaner. Plant efficiency suffered; management asked us for a solution.

"We obliged by suggesting *SBS-30 Waterless Skin Cleanser.* After telling them how completely SBS-30 has cleared up skin hygiene problems in other plants, we showed them how easily they could set up waterless washstations . . . anywhere in the mill where they have hard-to-remove soil problems. We pointed out other SBS-30 advantages: elimination of washing with harmful solvents, fewer trips to washrooms . . . happier employees working more efficiently!"

Money-saving suggestions like this *begin* with OPERATION PINPOINT–a thought-provoking presentation filled with facts about skin hygiene and washroom maintenance. The SBS soap counselor serving your area can pinpoint the right soap to do every skin cleansing job best and at lowest cost in your plant. Let him show you OPERATION PINPOINT . . . just call your nearest SBS office, collect.

the washword of industry

SBS sugar beet products co.

SAGINAW, MICH. • Los Angeles, Calif. • Newark, N. J.
CANADA: Chemical By-Products, Ltd., Toronto, Ontario

Index of Advertisers

American Cyanamid Co. 49
Armour Pharmaceutical Co. . .15
Bard-Parker Co. 40
Becton, Dickinson & Co. 32
Bristol-Myers Co. 44
Chesebrough-Ponds, Inc. 48
Ciba Pharmaceutical Products, Inc. 21
Doak Pharmacal Co., Inc. 43
Dome Chemicals, Inc. 29
Eaton Laboratories 11
Emergency Kit Corp. 39
Geriatric Pharmaceutical Corp. 42
Gojer, Inc. 42
International College of Surgeons 34
Lederle Laboratories 7
Lilly & Co., Eli 36
McNeil Laboratories, Inc. 46, 47
Merck Sharp & Dohme . .23, 33
Minnesota Mining & Manufacturing Co. 45
Pfizer Laboratories . . . 26, 27, 3rd cover
Parke, Davis & Co. 17
Riker Laboratories, Inc. . . . . .2nd cover
Robins Co., Inc., A. H. . 2, 28
Sanborn Co. 5
Saunders Co., W. B. 27
Schering Corp. 1
Searle & Co., G. D. 37
Shield Laboratories 41
Sugar Beet Products Co. . . .50
Upjohn Co. 9
Wallace Laboratories . . 13, 24, 25, 35, 4th cover
Whitehall Laboratories . .19, 38
Winthrop Laboratories . .30, 31
Woodward Medical Personnel Bureau 39

now available in new multi-dose vial

Terramycin®

BRAND OF OXYTETRACYCLINE

INTRAMUSCULAR SOLUTION

conveniently preconstituted for prompt parenteral administration in office or at bedside

new 10 cc. vial permits greater economy, convenience, and flexibility in dosage

IN BRIEF

Terramycin Intramuscular Solution, a *preconstituted* parenteral form of oxytetracycline with 2% Xylocaine* as a local anesthetic, facilitates prompt initiation of broad-spectrum antibiotic therapy when immediate oral administration is inconvenient or impractical. There is a low incidence of irritation or pain at the injection site. Availability of the *new*, multi-dose 10 cc. vial permits greater *economy, convenience,* and *flexibility* in dosage. The dependability of Terramycin is based on broad antimicrobial effectiveness, excellent toleration, and low order of toxicity.

INDICATIONS: All oxytetracycline indications whenever initial or continuing therapy with I.M. injection is indicated. Compatible oral therapy may then be given with Cosa-Terramycin® Capsules or Cosa-Terrabon® Suspension. Effective against both gram-positive and gram-negative bacteria, rickettsiae, spirochetes, and large viruses, Terramycin therapy is indicated in a great variety of infections due to susceptible organisms. These include infections of the respiratory tract, ophthalmic and otic infections, gastrointestinal infections, genitourinary infections, soft-tissue infections, and many others.

ADMINISTRATION AND DOSAGE: For intramuscular injection only. Unless otherwise specified, a dose of 100 mg. every 8-12 hours, or a single daily dose of 250 mg. should be adequate for most mild or moderately severe infections. In *severe* infections, 100 mg. every 6-8 hours or 250 mg. every 12 hours may be necessary. Dosage for infants and children is proportionately less and should be determined in accordance with age and weight of the patient, and severity of infection.

SIDE EFFECTS AND PRECAUTIONS: Aside from occasional mild pain at injection site, adverse reactions (including allergic) have been rare. As with all I.M. preparations, injection should be made within the body of a relatively large muscle. After insertion of needle, aspiration should be attempted before injecting to avoid inadvertent administration into a blood vessel; care should always be taken to avoid injecting into a major nerve or its surrounding sheath. Subcutaneous and fat-layer injection may cause mild pain and induration, which may be relieved by an ice pack.

Use of antibiotics may result in an overgrowth of nonsusceptible organisms—particularly monilia and resistant staphylococci. If a new infection caused by a resistant pathogen appears, discontinue the medication and institute appropriate specific therapy as indicated by susceptibility testing.

SUPPLIED: *Terramycin Intramuscular Solution* is available in the new 10 cc. multi-dose vial, providing five 2 cc. doses, 50 mg./cc., and in 2 cc. prescored glass ampules, containing 100 mg. and 250 mg., packages of 5 and 100. For maximum rapidity of effect—*Terramycin Intravenous,* in vials of 250 mg. and 500 mg. (buffered with 1 Gm. and 2 Gm. ascorbic acid, respectively). Available for oral therapy: *Cosa-Terramycin® Capsules,* 250 mg. and 125 mg.; *Cosa-Terrabon® Oral Suspension* (preconstituted), 125 mg. per 5 cc. teaspoonful, in bottles of 2 oz. (60 cc.) and 1 pint; *Cosa-Terrabon® Pediatric Drops* (preconstituted), 5 mg. per drop (100 mg. per cc.), bottle of 10 cc. with calibrated plastic dropper. In addition, a variety of other systemic and local dosage forms are available to meet specific therapeutic requirements.

More detailed professional information available on request.

*Xylocaine® is the trademark of Astra Pharmaceutical Products, Inc. for its brand of lidocaine.

a reservoir of dependable performance— Terramycin® therapy

Science for the world's well-being™ Pfizer PFIZER LABORATORIES *Division, Chas. Pfizer & Co., Inc., Brooklyn 6, New York*

Proven

in over five years of clinical use and
more than 750 published clinical studies

Effective

for relief of anxiety and tension

Outstandingly Safe

- simple dosage schedule produces rapid, reliable tranquilization without unpredictable excitation
- no cumulative effects, thus no need for difficult dosage readjustments
- does not produce ataxia, change in appetite or libido
- does not produce depression, Parkinson-like symptoms, jaundice or agranulocytosis
- does not impair mental efficiency or normal behavior

Miltown®

meprobamate (Wallace)

Usual dosage: One or two 400 mg. tablets t.i.d.
Supplied: 400 mg. scored tablets, 200 mg. sugar-coated tablets; or as MEPROTABS®—400 mg. *unmarked*, coated tablets.

WALLACE LABORATORIES / *Cranbury, N. J.*

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